

# SEARCH REQUEST FORM

## Scientific and Technical Information Center

Requester's Full Name: Sin J. Lee Examiner #: 76060 Date: 10-12-04  
Art Unit: 1752 Phone Number 302-1333 Serial Number: 10/718 959  
Mail Box and Bldg/Room Location: 9D66 Results Format Preferred (circle): PAPER DISK E-MAIL  
(Rem.)

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Photoresist Polymer & photo resist composition Containing  
the same

Inventors (please provide full names):

Lee, Geun Su

Earliest Priority Filing Date: 11-21-2003

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for the polymer of Formula I  
in claim 1.

(the method of making such polymer  
is explained in claim #4)

SCIENTIFIC REFERENCE BR  
Sci. & Tech. Info. Ctr

OCT 13

Pat. & T.M. Office

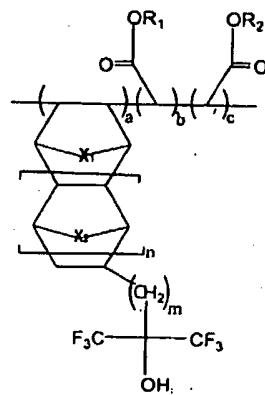
### STAFF USE ONLY

|                                 | Type of Search  | Vendors and cost where applicable |
|---------------------------------|-----------------|-----------------------------------|
| Searcher: <u>Ed</u>             | NA Sequence (#) | STN                               |
| Searcher Phone #:               | AA Sequence (#) | Dialog                            |
| Searcher Location:              | Structure (#)   | Questel/Orbit                     |
| Date Searcher Picked Up:        | Bibliographic   | Dr. Link                          |
| Date Completed: <u>10-15-04</u> | Litigation      | Lexis/Nexis                       |
| Searcher Prep & Review Time:    | Fulltext        | Sequence Systems                  |
| Clerical Prep Time:             | Patent Family   | WWW/Internet                      |
| Online Time:                    | Other           | Other (specify)                   |

What is Claimed is:

1. A photoresist polymer comprising a repeating unit represented by  
Formula 1:

Formula 1



wherein

X<sub>1</sub> and X<sub>2</sub> individually are selected from the group consisting of CH<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub>, O and S;

R<sub>1</sub> is selected from the group consisting of acid labile protecting group, C<sub>1</sub>-C<sub>20</sub> alkyl and C<sub>1</sub>-C<sub>20</sub> cycloalkyl;

R<sub>2</sub> is H, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>5</sub>-C<sub>10</sub> cycloalkyl, or C<sub>5</sub>-C<sub>10</sub> cycloalkyl including an ether group, and C<sub>5</sub>-C<sub>10</sub> cycloalkyl including an ester group;

m is an integer ranging from 0 to 2,

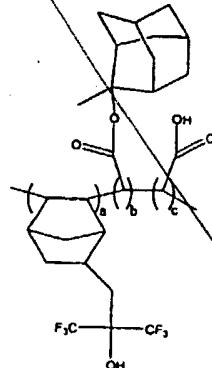
n is an integer of 0 or 1; and

the relative ratio of a : b : c is in the range of 50 mol% : 20~50 mol% : 0~30 mol%.

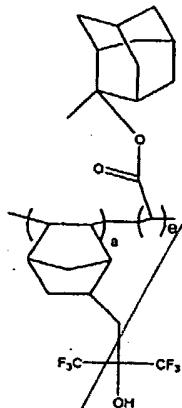
2. The photoresist polymer according to claim 1, wherein the acid labile protecting group is selected from the group consisting of t-butyl, tetrahydropyran-2-yl, 2-methyl tetrahydropyran-2-yl, tetrahydrofuran-2-yl, 2-methyl tetrahydrofuran-2-yl, 1-methoxypropyl, 1-methoxy-1-methyl ethyl, 1-ethoxypropyl, 1-ethoxy-1-methyl ethyl, 1-methoxyethyl, 1-ethoxyethyl, t-butoxyethyl, 1-isobutoxyethyl and 2-acetylment-1-yl.

3. The photoresist polymer according to claim 1, further comprising a repeating unit of Formula 2 or 3:

### Formula 2



### Formula 3



wherein

the relative ratio of a : b : c is in the range of 50 mol% : 20~50 mol% : 0~30 mol%; and

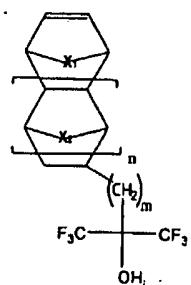
the relative ratio of a : e is 50 mol% : 50 mol%.

4. A method for forming a photoresist polymer, comprising the steps of:
  - (a) polymerizing a compound of Formula 7 and maleic-anhydride under the presence of polymer initiators to obtain a polymer of Formula 4;

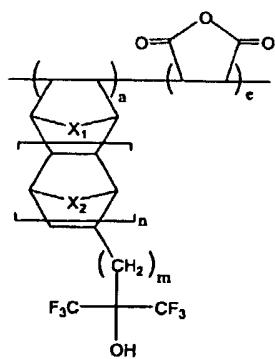
(b) reacting a polymer of Formula 4 with alcohol or an alkoxide compound and ring-opening maleic anhydride in the polymer to obtain a polymer of Formula 5; and

(c) esterifying or acetylating a partial or whole carboxyl group of a polymer of Formula 5 to obtain the repeating unit of following Formula 1:

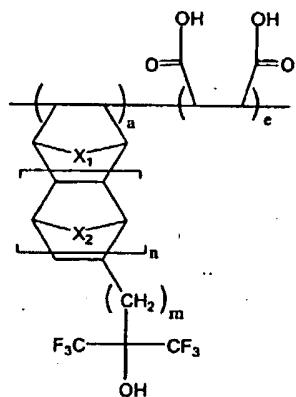
Formula 7



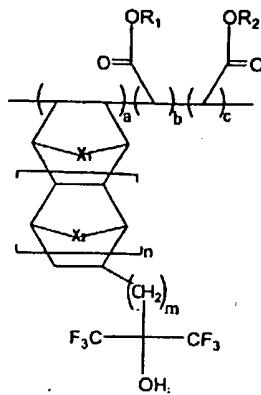
Formula 4



Formula 5



Formula 1



wherein

X<sub>1</sub> and X<sub>2</sub> individually are selected from the group consisting of CH<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub>, O and S;

R<sub>1</sub> is selected from the group consisting of acid labile protecting group, C<sub>1</sub>-C<sub>20</sub> alkyl and C<sub>1</sub>-C<sub>20</sub> cycloalkyl;

R<sub>2</sub> is selected from the group consisting of H, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>5</sub>-C<sub>10</sub> cycloalkyl, C<sub>5</sub>-C<sub>10</sub> cycloalkyl including an ether group, and C<sub>5</sub>-C<sub>10</sub> cycloalkyl including an ester group;

m is an integer ranging from 0 to 2,

n is 0 or 1;

the relative ratio of a : b : c is in the range of 50 mol% : 20~50 mol% : 0~30 mol%; and

the relative ratio of a : e is 50 mol% : 50 mol%.

5. The method according to claim 4, wherein the polymerization of step

(a) is performed using single or mixture solution selected from the group consisting of cyclohexanone, cyclopentanone, tetrahydrofuran, dimethyl-formamide, dimethylsulfoxide, dioxane, methylethylketone, benzene, toluene and xylene.

6. The method according to claim 4, wherein the polymer initiator of step

(a) is selected from the group consisting of benzoyl peroxide, 2,2'-azobisisobutyronitrile (AIBN), acetylperoxide, laurylperoxide, t-butylperacetate, t-butylhydroperoxide and di-t-butylperoxide.

=> file reg

FILE 'REGISTRY' ENTERED AT 17:15:32 ON 15 OCT 2004  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2004 American Chemical Society (ACS)

=> d his

FILE 'LREGISTRY' ENTERED AT 16:52:51 ON 15 OCT 2004  
L1 STR  
L2 STR

FILE 'REGISTRY' ENTERED AT 17:05:22 ON 15 OCT 2004  
L3 SCR 2043  
L4 0 S L1 AND L2  
L5 28 S L1  
L6 485 S L1 FUL  
SAV L6 LEE959/A  
E MALEIC ANHYDRIDE/CN  
L7 1 S E3  
E MALEIC ACID/CN  
L8 1 S E3

FILE 'HCA' ENTERED AT 17:08:31 ON 15 OCT 2004  
L9 234 S L6  
L10 42841 S L7 OR L8  
L11 2 S L9 AND L10  
L12 QUE ALCOHOL## OR ALC#  
L13 53249 S ALKOXID? OR METHOXID? OR ETHOXID? OR PROPOXID? OR ISOPR  
L14 16 S L9 AND L12  
L15 0 S L9 AND L13

FILE 'REGISTRY' ENTERED AT 17:11:12 ON 15 OCT 2004  
L16 0 S L1 AND L2 SSS SAM SUB=L6  
L17 STR L2  
L18 2 S L1 AND L17 SSS SAM SUB=L6  
L19 22 S L1 AND L17 SSS FUL SUB=L6  
SAV L19 LEE959A/A  
L20 417 S L6 AND PMS/CI  
L21 22 S L19 AND L20

FILE 'HCA' ENTERED AT 17:13:30 ON 15 OCT 2004  
L22 18 S L21  
L23 0 S L11 AND (L14 OR L22)  
L24 36 S L11 OR L14 OR L22  
L25 20 S L11 OR L22

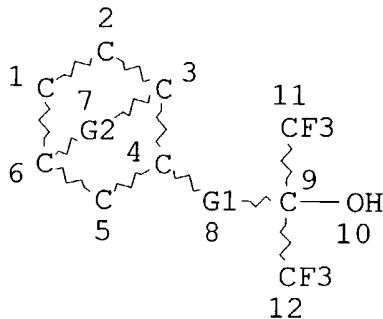
Lee 10/718, 959

Page 2

L26 16 S L14 NOT L25

FILE 'REGISTRY' ENTERED AT 17:15:32 ON 15 OCT 2004

=> d 119 que stat  
L1 STR



REP G1=(0-5) C

REP G2=(1-2) A

## NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFALT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

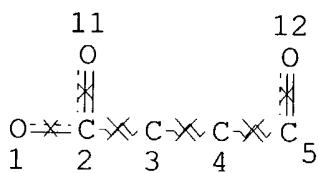
RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 12

#### STEREO ATTRIBUTES: NONE

L6 485 SEA FILE=REGISTRY SSS FULL 11

105 SEAS  
L17 STR



## NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 7

STEREO ATTRIBUTES: NONE

L19 22 SEA FILE=REGISTRY SUB=L6 SSS FUL L1 AND L17

100.0% PROCESSED 224 ITERATIONS  
SEARCH TIME: 00.00.01

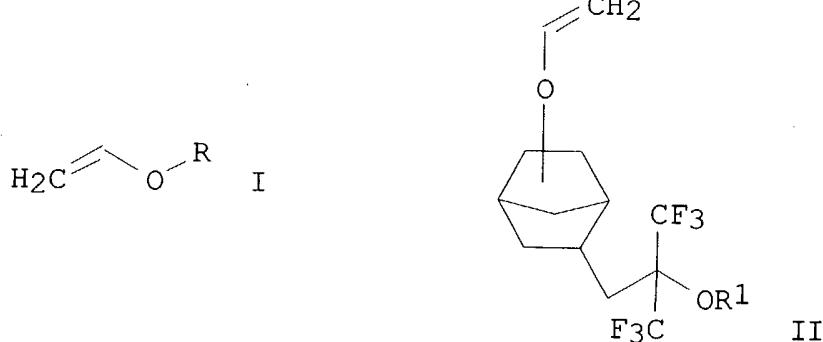
22 ANSWERS

=> file hca  
 FILE 'HCA' ENTERED AT 17:15:41 ON 15 OCT 2004  
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
 COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

=&gt; d 125 1-20 cbib abs hitstr hitind

L25 ANSWER 1 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 140:424105 Fluorine-containing vinyl ethers, their polymers, and resist  
 compositions using such polymers. Kobayashi, Satoru; Maeda,  
 Kazuhiko; Tsujishita, Tooru (Central Glass Company, Limited, Japan).  
 PCT Int. Appl. WO 2004041762 A1 20040521, 45 pp. DESIGNATED  
 STATES: W: KR, US. (English). CODEN: PIXXD2. APPLICATION: WO  
 2003-JP13924 20031030. PRIORITY: JP 2002-320871 20021105; JP  
 2003-22925 20030131.

GI



AB The invention relates to a fluorine-contg. vinyl ether represented by the formula (I), wherein R = an org. group contg. at least one fluorine atom and a cyclic structure. The invention further relates to a fluorine-contg. copolymer contg. (a) a first unit derived from a first monomer that is a fluorine-contg. vinyl ether represented by

the formula (II) where R1 = H or C1-8 alkyl group that optionally contains an oxygen atom; and (b) a second unit derived from a second monomer that is at least one selected from acrylic esters and methacrylic esters.

IT 691870-46-9P

(fluorine-contg. vinyl ethers, their polymers, and resist compns. using such polymers)

RN 691870-46-9 HCA

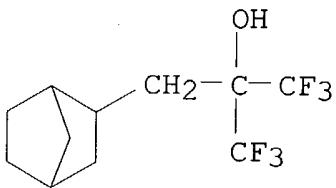
CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.13,7]dec-2-yl ester, polymer with 5(or 6)-(ethoxyloxy)-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]heptane-2-ethanol and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

CRN 634200-89-8

CMF C13 H16 F6 O2

CCI IDS

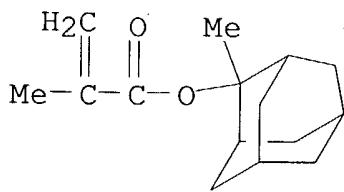


H<sub>2</sub>C=CH-O-D1

CM 2

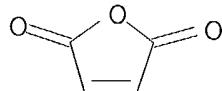
CRN 177080-67-0

CMF C15 H22 O2



CM 3

CRN 108-31-6  
CMF C4 H2 O3

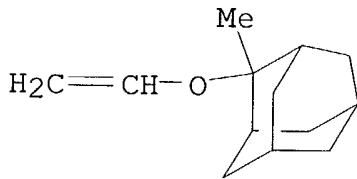


IC ICM C07C043-192  
ICS C07C043-196; C07C043-225; C07C043-23; C07C043-172; C08F016-12;  
G03F007-039  
CC 35-4 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 76  
IT 634200-99-0P 691870-38-9P 691870-39-0P 691870-40-3P  
691870-41-4P 691870-42-5P 691870-43-6P 691870-44-7P  
691870-45-8P **691870-46-9P** 691870-47-0P  
(fluorine-contg. vinyl ethers, their polymers, and resist compns.  
using such polymers)

L25 ANSWER 2 OF 20 HCA COPYRIGHT 2004 ACS on STN  
140:312008 Positive-working resist composition with improved precision  
in response to light. Fujimori, Toru (Fuji Photo Film Co., Ltd.,  
Japan). Jpn. Kokai Tokkyo Koho JP 2004102019 A2 ~~20040402~~, 75 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-265400 20020911.  
AB Title resist compn. comprises (A) a compd. generating acid upon  
actinic ray irradn., (B) a fluorine-contg. polymer which decompns.  
and has increased solv. in alk. developing liq. in the presence of  
an acid, and (C) at least one nitrogen-contg. ionic basic compd.  
IT **430437-11-9P**  
(pos.-working resist compn. with improved precision in response  
to light)  
RN 430437-11-9 HCA  
CN 2,5-Furandione, polymer with .alpha.,.alpha.-  
bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and  
2-(ethenyloxy)-2-methyltricyclo[3.3.1.13,7]decane (9CI) (CA INDEX  
NAME)

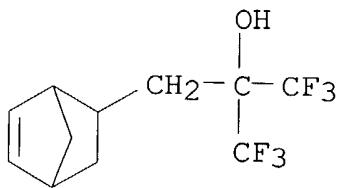
CM 1

CRN 430437-10-8  
CMF C13 H20 O



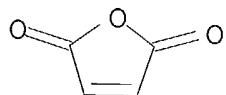
CM 2

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 3

CRN 108-31-6  
 CMF C4 H2 O3



IC ICM G03F007-039  
 ICS G03F007-004; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 IT 109-92-2DP, Ethyl vinyl ether, reaction products with hydroxy-contg. polymers 103983-46-6DP, reaction products with hydroxy-contg. polymers 262617-13-0P 370866-15-2P 430436-66-1P 430436-68-3P 430436-78-5P 430436-81-0P 430436-90-1P 430436-91-2P 430436-97-8P 430436-98-9P **430437-11-9P** 430437-12-0P 430437-14-2P 430437-17-5P 430437-22-2P 430437-27-7P 430437-33-5P 430437-35-7P 430437-40-4P 431062-16-7P 431062-17-8P 431062-18-9P 431062-20-3P 462109-80-4DP, reaction products 524952-70-3P 524952-73-6P 524952-74-7P 540729-51-9P 676488-04-3P

(pos.-working resist compn. with improved precision in response to light)

L25 ANSWER 3 OF 20 HCA COPYRIGHT 2004 ACS on STN

139:267983 Positive-working photoresist composition containing polymer with fluoro-aliphatic group. Fujimori, Toru (Fuji Photo Film Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003262952 A2 20030919, 88 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-65444 20020311.

AB The compn. contains (A) a compd. generating an acid by irradn. of actinic ray, (B) a resin which decompns. by the action of an acid and whose solv. in alk. developer increases, and (C) a polymer with fluoro-aliph. group formed from a monomer  $\text{CH}_2:\text{CR}_1\text{COX}(\text{CH}_2)_m(\text{CF}_2\text{CF}_2)_n\text{F}$  ( $\text{R}_1 = \text{H, Me}; \text{X} = \text{O, S, NR}_2; m = 1-6; n = 2-4; \text{R}_2 = \text{H, C}_1\text{-4 alkyl}$ ). Developing defect is prevented and the compn. is useful for manuf. of integrated circuits, semiconductor device, and wiring substrates.

IT 430437-11-9P

(pos. photoresist compn. contg. polymer with fluoro-aliph. group)

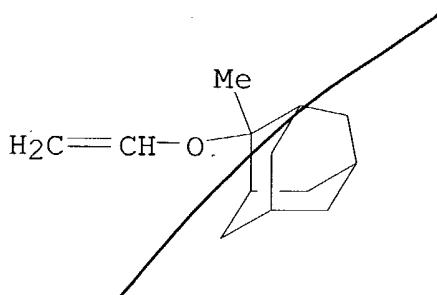
RN 430437-11-9 HCA

CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2-(ethenyloxy)-2-methyltricyclo[3.3.1.13,7]decane (9CI) (CA INDEX NAME)

CM 1

CRN 430437-10-8

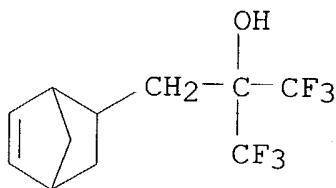
CMF C13 H20 O



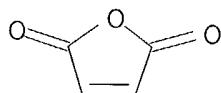
CM 2

CRN 196314-61-1

CMF C11 H12 F6 O



CM 3

CRN 108-31-6  
CMF C4 H2 O3

IC ICM G03F007-004  
 ICS C08F020-22; C08F020-38; C08F020-54; C08F020-68; C08F020-70;  
 G03F007-033; G03F007-039; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 Section cross-reference(s): 38  
 IT 250378-10-0P, Butyrolactone methacrylate-2-ethyl-2-adamantyl  
 methacrylate copolymer 262617-13-0P 328061-11-6P 350992-58-4P  
 351197-82-5P 359635-35-1P 364736-22-1P 367283-78-1P  
 391232-36-3P 398140-38-0P 398140-43-7P 398140-45-9P  
 398140-57-3P 398140-64-2P 398140-69-7P 398140-79-9P  
 398140-86-8P 398140-87-9P 398140-88-0P 398140-89-1P  
 398141-00-9P 398141-11-2P 398141-14-5P 430436-66-1P  
 430436-67-2P 430436-68-3P 430436-70-7P 430436-72-9P  
 430436-74-1P 430436-76-3P 430436-78-5P 430436-79-6P  
 430436-81-0P 430436-82-1P 430436-84-3P 430436-85-4P  
 430436-86-5P 430436-87-6P 430436-89-8P 430436-90-1P  
 430436-91-2P 430436-92-3P 430436-94-5P 430436-95-6P  
 430436-97-8P 430436-98-9P 430436-99-0P 430437-01-7P  
 430437-03-9P 430437-04-0P 430437-05-1P 430437-07-3P  
 430437-09-5P **430437-11-9P** 430437-12-0P 430437-13-1P  
 430437-14-2P 430437-15-3P 430437-17-5P 430437-18-6P  
 430437-19-7P 430437-21-1P 430437-22-2P 430437-24-4P  
 431062-12-3P 431062-14-5P 431062-16-7P 431062-17-8P  
 431062-18-9P 431062-20-3P 431062-22-5P 482609-97-2P  
 503003-64-3P 524699-47-6P 532989-17-6P 601490-00-0P  
 601490-01-1P 601490-02-2P 601490-03-3P

(pos. photoresist compn. contg. polymer with fluoro-aliph. group)

L25 ANSWER 4 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 139:252537 Positive resist composition. Fujimori, Toru (Fuji Photo Film Co., Ltd., Japan). Eur. Pat. Appl. EP 1347335 A1 20030924, 89 pp.  
 DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2003-6122 20030318. PRIORITY: JP 2002-74565 20020318.

AB A pos. photoresist compn. used in fabrication of semiconductor devices comprises: (A) a compd. capable of generating an acid on exposure to active light rays or a radiation; (B) a resin which is insol. or sparingly sol. in an alkali and becomes alkali-sol. by an action of an acid; and (C) an acyclic compd. having at least three groups selected from a hydroxyl group and a substituted hydroxyl group.

IT **430437-11-9P**

(pos. photoresist compn. contg.)

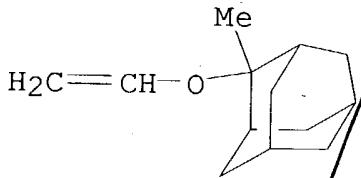
RN 430437-11-9 HCA

CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2-(ethenylloxy)-2-methyltricyclo[3.3.1.13,7]decane (9CI) (CA INDEX NAME)

CM 1

CRN 430437-10-8

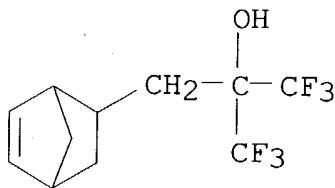
CMF C13 H20 O



CM 2

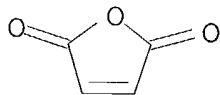
CRN 196314-61-1

CMF C11 H12 F6 O



CM 3

CRN 108-31-6  
 CMF C<sub>4</sub> H<sub>2</sub> O<sub>3</sub>



IC ICM G03F007-039  
 ICS G03F007-004  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 35, 38  
 IT 109-92-2DP, Ethyl vinyl ether, reaction product with polyhydroxystyrene 24979-70-2DP, VP15000, reaction product with alkyl vinyl ether 159296-87-4P 200808-68-0P 250378-10-0P, Butyrolactone methacrylate-2-ethyl-2-adamantyl methacrylate copolymer 262617-13-0P 288303-55-9P 325143-38-2P 364736-22-1P 391232-36-3P 398140-43-7P 398140-45-9P 398140-47-1P 398140-50-6P 398140-52-8P 398140-55-1P 398140-57-3P 398140-59-5P 398140-64-2P 398140-69-7P 398140-73-3P 398140-77-7P 398140-78-8P 398140-79-9P 398140-81-3P 398140-88-0P, tert-Butyl norbornenecarboxylate-maleic anhydride-2-methyl-2-adamantyl acrylate-norbornene lactone acrylate copolymer 398140-89-1P 398140-94-8P 398141-00-9P 398141-11-2P 398141-13-4P 398141-14-5P 405509-18-4P 430436-66-1P 430436-67-2P 430436-68-3P 430436-70-7P 430436-72-9P 430436-74-1P 430436-76-3P 430436-78-5P 430436-79-6P 430436-81-0P 430436-82-1P 430436-84-3P 430436-85-4P 430436-86-5P 430436-87-6P 430436-89-8P 430436-90-1P 430436-91-2P 430436-92-3P 430436-94-5P 430436-95-6P 430436-97-8P 430436-98-9P 430436-99-0P 430437-01-7P 430437-03-9P 430437-04-0P 430437-05-1P 430437-09-5P **430437-11-9P** 430437-12-0P 430437-13-1P 430437-14-2P 430437-15-3P 430437-17-5P 430437-18-6P 430437-19-7P 430437-21-1P 430437-24-4P 431062-12-3P

431062-14-5P 431062-16-7P 431062-17-8P 431062-18-9P  
 431062-20-3P 431062-22-5P 462109-80-4P 471257-28-0P  
 503003-64-3P 597553-03-2P 597553-04-3P  
 (pos. photoresist compn. contg.)

L25 ANSWER 5 OF 20 HCA COPYRIGHT 2004 ACS on STN

139:252521 Negative photoresists for short wavelength imaging. Barclay, George G.; Pugliano, Nicholas (Shipley Company, LLC, USA). PCT Int. Appl. WO 2003077029 A1 20030918, 42 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US6532 20030304. PRIORITY: US 2002-PV361547 20020304.

AB New neg.-acting photoresist compns. are provided that are particularly useful for imaging at short wavelengths, particularly sub-200 nm wavelengths such as 193 nm. Resists of the invention provide contrast between exposed and unexposed coating process layer regions through crosslinking or other solv. switching mechanism. Preferred resists of the invention include a resin component that contains repeat units that facilitate aq. base solv.

IT 600155-32-6P

(neg. photoresists for short wavelength imaging)

RN 600155-32-6 HCA

CN 2-Propenoic acid, 2-methyl-, hydroxytricyclo[3.3.1.13,7]decyl ester, polymer with .alpha..alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and 2,5-furandione (9CI) (CA INDEX NAME)

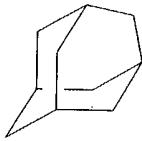
CM 1

CRN 600155-31-5

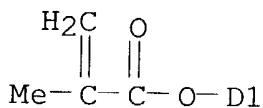
CMF C14 H20 O3

CCI IDS

20030235785

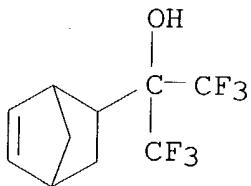


D1—OH



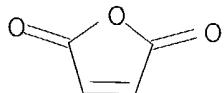
CM 2

CRN 369375-16-6  
 CMF C10 H10 F6 O



CM 3

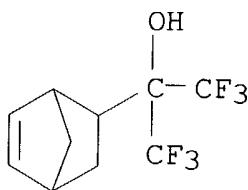
CRN 108-31-6  
 CMF C4 H2 O3



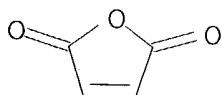
IT 600154-26-5P, 1,1,1,3,3,3-Hexafluoropropan-2-ol-norbornen-maleic anhydride copolymer  
 (resin; neg. photoresists for short wavelength imaging)  
 RN 600154-26-5 HCA  
 CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol (9CI) (CA)

INDEX NAME)

CM 1

CRN 369375-16-6  
CMF C10 H10 F6 O

CM 2

CRN 108-31-6  
CMF C4 H2 O3IC ICM G03C005-00  
ICS G03F007-004CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)

IT 600155-32-6P

(neg. photoresists for short wavelength imaging)

IT 600154-26-5P, 1,1,1,3,3,3-Hexafluoropropan-2-ol-norbornen-  
maleic anhydride copolymer

(resin; neg. photoresists for short wavelength imaging)

L25 ANSWER 6 OF 20 HCA COPYRIGHT 2004 ACS on STN

138:393073 Positive-working photoresist composition containing  
fluoro-substituted nitrogen compound. Fujimori, Toru; Kanna,  
Shinichi (Fuji Photo Film Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho  
JP 2003140349 A2 20030514, 53 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 2001-339439 20011105.AB The compn. contains (A) a polymer with F-substituted main chain or  
side chain and becomes sol. in alk. developer by the decompn. caused  
by an acid, (B) a compd. generating acid by actinic ray or  
radiation, and (C) a nitrogen compd. contg. .gtoreq.1 F atom. The  
compn. gives clear pattern without development defect.

IT 430437-11-9P

(pos. photoresist contg. F-contg. alkali-sol. polymer, acid generator, and F-contg. nitrogen compd.)

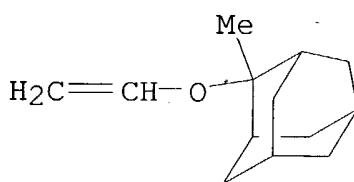
RN 430437-11-9 HCA

CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2-(ethenyloxy)-2-methyltricyclo[3.3.1.13,7]decane (9CI) (CA INDEX NAME)

CM 1

CRN 430437-10-8

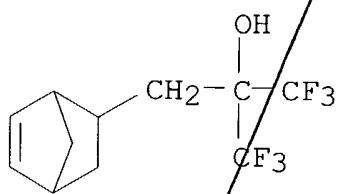
CMF C13 H20 O



CM 2

CRN 196314-61-1

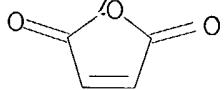
CMF C11 H12 F6 O



CM 3

CRN 108-31-6

CMF C4 H2 O3



IC ICM G03F007-039

ICS C08F012-22; C08F014-26; C08F014-28; C08F016-26; C08F016-38;

C08F020-22; C08F020-28; C08F020-44; C08F032-04; G03F007-004;  
H01L021-027

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)  
Section cross-reference(s): 38

IT 143643-34-9P 262617-13-0P 370866-13-0P 370866-15-2P  
397302-29-3P 430436-67-2P 430436-68-3P 430436-70-7P  
430436-72-9P 430436-74-1P 430436-76-3P 430436-78-5P  
430436-79-6P 430436-81-0P 430436-82-1P 430436-84-3P  
430436-85-4P 430436-86-5P 430436-87-6P 430436-89-8P  
430436-90-1P 430436-92-3P 430436-94-5P 430436-98-9P  
430436-99-0P 430437-01-7P 430437-03-9P 430437-04-0P  
430437-05-1P 430437-09-5P **430437-11-9P** 430437-12-0P  
430437-13-1P 430437-17-5P 430437-18-6P 430437-19-7P  
430437-21-1P 430437-22-2P 430437-24-4P 430437-27-7P  
430437-29-9P 430437-33-5P 430437-36-8P 430437-37-9P  
430437-39-1P 430437-40-4P 431062-12-3P 431062-14-5P  
431062-16-7P 431062-17-8P 431062-18-9P 431062-20-3P  
431062-22-5P 487048-93-1P 524952-65-6P 524952-66-7P  
524952-68-9P 524952-69-0P 524952-70-3P 524952-71-4P  
524952-72-5P 524952-73-6P 524952-74-7P

(pos. photoresist contg. F-contg. alkali-sol. polymer, acid  
generator, and F-contg. nitrogen compd.)

L25 ANSWER 7 OF 20 HCA COPYRIGHT 2004 ACS on STN

138:392959 High-performance 193-nm resist composition using hybrid  
copolymers of cycloolefin/maleic anhydride (COMA)/methacrylate.  
Rahman, Dalil; Alemy, Eric L.; Conley, Will; Miller, Daniel; Dammel,  
Ralph R.; Kim, Woo-Kyu; Kudo, Takanori; Lee, SangHo; Masuda, Seiya;  
McKenzie, Douglas S.; Padmanaban, Munirathna (AZ Electron. Mater.,  
Clariant Corp., Somerville, NJ, 08876, USA). Proceedings of  
SPIE-The International Society for Optical Engineering, 4690(Pt. 1,  
Advances in Resist Technology and Processing XIX), 127-135 (English)  
2002. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The  
International Society for Optical Engineering.

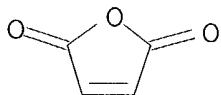
AB A high performance 193 nm resist has been developed from a novel  
hybrid copolymer based on a cycloolefin-maleic anhydride and  
methacrylate (COMA/methacrylate) polymer system. A variety of  
copolymers have been synthesized from tert-Bu 5-norbornene-2-  
carboxylate (BNC), tert-Bu tetracyclo[4.4.0.1.2,617,10]dodec-8-ene-3-  
carboxylate (TCDBC), tert-butoxycarbonylmethyltetracyclo[4.4.0.1]dod  
ec-8-ene-3-carboxylate (BTCDC) and 5-[2-trifluoromethyl-2,1,1-  
trifluoro-2-hydroxypropyl]-2-norbornene (F1) with different types of  
methacrylate monomers and maleic anhydride (MA). The effect of the  
monomers and the ratio of monomers in the copolymer on lithog.  
performance and etch rate has been studied. Lithog. evaluation of  
some of these polymers has shown resoln. down to 80 nm using  
conventional 193 nm illumination and std. development conditions,

particularly for semi and fully isolated lines. This paper will report the chem. of the polymer platform and relative advantages of having certain monomers in terms of lithog. performance and line edge roughness.

IT 108-31-6, Maleic anhydride, reactions 196314-61-1  
(monomer; lithog. properties of 193-nm photoresist based on hybrid copolymers of cycloolefin/maleic anhydride/methacrylate as function of monomers and their ratio)

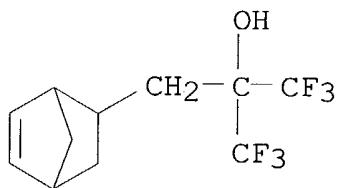
RN 108-31-6 HCA

CN 2,5-Furandione (9CI) (CA INDEX NAME)



RN 196314-61-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)

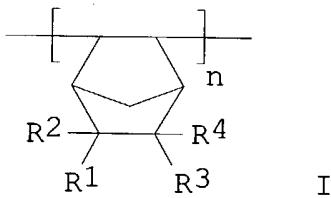


CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 108-31-6, Maleic anhydride, reactions 154970-45-3, Tert-Butyl-5-norbornene-2-carboxylate 177080-66-9, Mevalonic lactone methacrylate 177080-67-0, 2-Methyl-2-adamantylmethacrylate 196314-61-1  
(monomer; lithog. properties of 193-nm photoresist based on hybrid copolymers of cycloolefin/maleic anhydride/methacrylate as function of monomers and their ratio)

L25 ANSWER 8 OF 20 HCA COPYRIGHT 2004 ACS on STN  
138:369658 Fluorine-containing norbornene polymers and their uses for antireflective films, photosensitive coatings, and resists. Koga, Tadashi; Maeda, Kazuhiko (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003137940 A2 20030514, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-339982 20011105.

GI



AB The polymers comprise norbornene repeating units I (R1-R4 = H, halo, C1-20 alkyl, CO<sub>2</sub>H, OH, cyano, etc.; .gtoreq.1 of R1-R4 = F-contg. group) and repeating units CR<sub>5</sub>R<sub>6</sub>R<sub>7</sub> (R<sub>5</sub>, R<sub>6</sub> = alkyl, fluoroalkyl; R<sub>5</sub> and/or R<sub>6</sub> = fluoroalkyl; R<sub>7</sub> = O, CH<sub>2</sub>). Thus, 39.70 g 3-(5-bicyclo[2.2.1]hepten-2-yl)-1,1,1-trifluoro-2-trifluoromethyl-2-propanol was polymd. with 10.30 g (F<sub>3</sub>C)<sub>2</sub>CO to give copolymer, which was made into a film showing 650-nm light reflectance 0.98% and good weather resistance.

IT **521949-39-3P**

(manuf. of F-contg. norbornene polymers for antireflective films, photosensitive coatings, and resists)

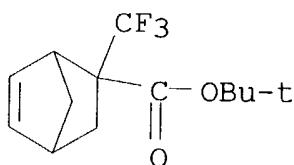
RN 521949-39-3 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol, 2,5-furandione and 3,3,3-trifluoro-2-(trifluoromethyl)-1-propene (9CI) (CA INDEX NAME)

CM 1

CRN 365568-55-4

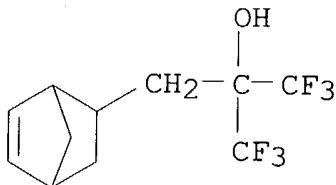
CMF C13 H17 F3 O2



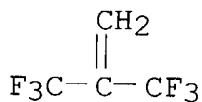
CM 2

CRN 196314-61-1

CMF C11 H12 F6 O



CM 3

CRN 382-10-5  
CMF C4 H2 F6CM 4  
CRN 108-31-6  
CMF C4 H2 O3

IC ICM C08F232-08  
 ICS C09D127-12; C09D145-00  
 CC 37-3 (Plastics Manufacture and Processing)  
 Section cross-reference(s): 38, 74  
 IT 521949-34-8P 521949-35-9P 521949-36-0P 521949-37-1P  
 521949-38-2P **521949-39-3P**

(manuf. of F-contg. norbornene polymers for antireflective films,  
 photosensitive coatings, and resists)

L25 ANSWER 9 OF 20 HCA COPYRIGHT 2004 ACS on STN

138:346488 Pattern formation method. Endo, Masayuki; Sasago, Masaru  
 (Matsushita Electric Industrial Co., Ltd., Japan). U.S. Pat. Appl.  
 Publ. US 2003082926 A1 20030501, 12 pp. (English). CODEN: USXXCO.  
 APPLICATION: US 2002-279070 20021024. PRIORITY: JP 2001-334168  
 20011031.

AB A resist film is formed from a chem. amplified resist material  
 including a base polymer having a protecting group released by a

function of an acid, an acrylic compd. and an acid generator that generates an acid when irradiated with light. The resist film is selectively irradiated with exposing light for pattern exposure, and is developed after the pattern exposure so as to form a resist pattern having a hole or groove opening. The size of the opening is reduced by irradiating the resist pattern with light with annealing.

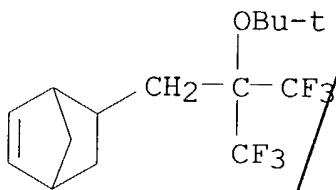
IT 518027-89-9

(pattern formation method contg.)

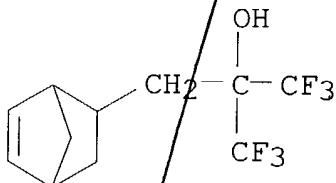
RN 518027-89-9 HCA

CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 5-[2-(1,1-dimethylethoxy)-3,3,3-trifluoro-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

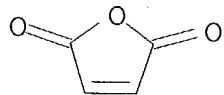
CRN 430436-83-2  
CMF C15 H20 F6 O

CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 3

CRN 108-31-6  
CMF C4 H2 O3



IC ICM H01L021-311  
 ICS H01L021-302; H01L021-461; H01L021-31; H01L021-469  
 NCL 438780000; 430005000; 438725000; 438710000; 438708000  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 Section cross-reference(s): 38  
 IT 153723-75-2, tert-Butoxystyrene-hydroxystyrene copolymer  
 154444-26-5, tert-Butoxycarbonyloxystyrene-hydroxystyrene copolymer  
 170283-35-9 177080-68-1, 2-Methyl-2-adamantyl methacrylate-  
 mevalonic lactone methacrylate copolymer 186676-37-9  
 188778-57-6, tert-Butoxycarbonylmethyloxystyrene-hydroxystyrene  
 copolymer 195000-67-0 195154-78-0 195154-83-7 250378-10-0  
 518027-82-2 518027-83-3 518027-84-4 518027-85-5 518027-86-6  
 518027-87-7 518027-88-8 518027-89-9 518027-90-2  
 518027-91-3 518027-92-4 518027-93-5 518047-92-2 518047-95-5  
 (pattern formation method contg.)

L25 ANSWER 10 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 138:311568 Chemical amplification type positive resist composition.  
 Takata, Yoshiyuki; Fujishima, Hiroaki; Uetani, Yasunori (Japan).  
 U.S. Pat. Appl. Publ. US ~~2003068573 A1~~ 20030410, 11 pp. (English).  
 CODEN: USXXCO. APPLICATION: US 2002-207997 20020731. PRIORITY: JP  
 2001-234649 20010802.

GI

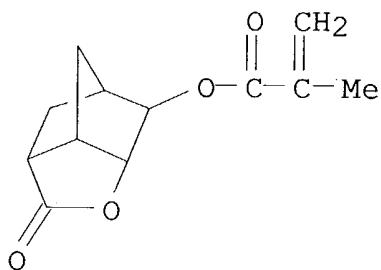
\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB A chem. amplification type pos. photoresist compn. is provided which  
 gives resist patterns showing remarkably improved line edge  
 roughness. A chem. amplification type pos. photoresist compn.  
 comprises an acid generator contg. a benzenesulfonate ion of I (Q1-5  
 = H, hydroxyl group, perfluoroalkyl group, alkyl group, alkoxy  
 group, halogen); and a resin having a polymn. unit carrying a group  
 unstable to an acid and polymn. unit of an alicyclic lactone of  
 formula II, III (R1-4 = H, Me group; n = 1-3).  
 IT 509097-33-0P  
 (resin; acid generation for chem. amplification type pos. resist  
 compn.)  
 RN 509097-33-0 HCA  
 CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl

ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol, 2,5-furandione and hexahydro-2-oxo-3,5-methano-2H-cyclopenta[b]furan-6-yl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

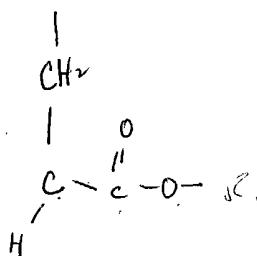
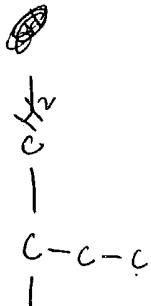
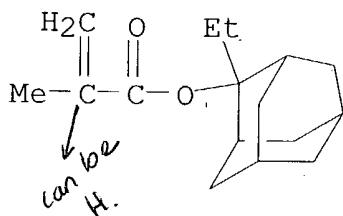
CM 1

CRN 254900-07-7  
 CMF C12 H14 O4



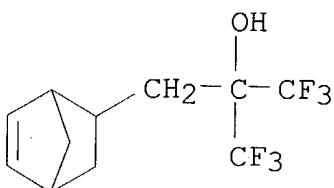
CM 2

CRN 209982-56-9  
 CMF C16 H24 O2

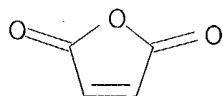


CM 3

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 4

CRN 108-31-6  
CMF C4 H2 O3

IC ICM G03F007-004  
 NCL 430270100; 430914000; 430921000; 430910000  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 Section cross-reference(s): 35, 38  
 IT **509097-33-0P**  
 (resin; acid generation for chem. amplification type pos. resist  
 compn.)

L25 ANSWER 11 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 138:262693 Positive photoresist composition. Fujimori, Toru; Kawabe,  
 Yasumasa (Fuji Photo Film Co., Ltd., Japan). Eur. Pat. Appl. EP  
 1296190 A1 20030326, 101 pp. DESIGNATED STATES: R: AT, BE, CH, DE,  
 DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI,  
 RO, MK, CY, AL, TR, BG, CZ, EE, SK. (English). CODEN: EPXXDW.  
 APPLICATION: EP 2002-21204 20020918. PRIORITY: JP 2001-285180  
 20010919; JP 2002-563 20020107.

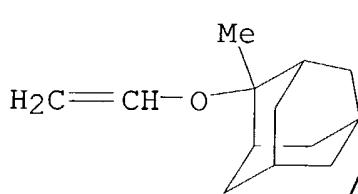
AB A pos. resist compn. comprises the components of: (A) a compd.  
 capable of generating an acid upon irradn. with one of an actinic  
 ray and a radiation; (B) a resin that is insol. or slightly sol. in  
 alkalis, but becomes alkali-sol. under an action of an acid; (C) a  
 basic compd.; and (D) a compd. comprising at least three hydroxyl  
 groups or at least three substituted hydroxyl groups, and comprising  
 at least one cyclic structure. The present invention relates to a  
 pos. resist compn. used in a process of manuf. semiconductors and  
 which far UV light with wavelengths  $\lambda \geq 250$  nm is used as an  
 exposure light source or an electron beam is used as an irradn.  
 source.

IT **430437-11-9P**  
 (pos. photoresist compn. contg.)

RN 430437-11-9 HCA  
 CN 2,5-Furandione, polymer with  $\alpha,\alpha$ -bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and  
 2-(ethenyl)oxy-2-methyltricyclo[3.3.1.13,7]decane (9CI) (CA INDEX  
 NAME)

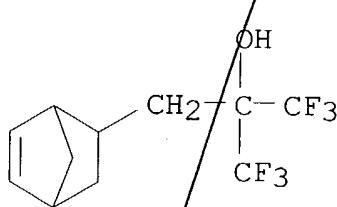
CM 1

CRN 430437-10-8  
 CMF C13 H20 O



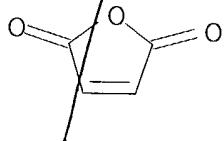
CM 2

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 3

CRN 108-31-6  
 CMF C4 H2 O3



IC ICM G03F007-039

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 35, 38, 76

IT 24979-70-2DP, VP15000, reaction product with Et vinyl ether

129674-22-2P 159296-87-4P 177034-73-0P 177034-75-2P

199432-82-1P 200808-68-0P 228101-60-8P 250378-10-0P,

Butyrolactone methacrylate-2-ethyl-2-adamantylmethacrylate copolymer

262617-13-0P 288303-55-9P 288620-13-3P 288620-15-5P

289706-85-0P 325143-38-2P 326591-96-2P 364736-22-1P

372968-15-5P 391232-36-3P 398140-38-0P 398140-43-7P

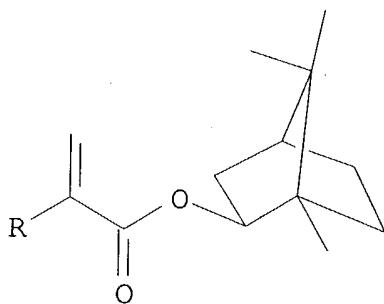
|              |                     |              |              |
|--------------|---------------------|--------------|--------------|
| 398140-45-9P | 398140-47-1P        | 398140-50-6P | 398140-52-8P |
| 398140-55-1P | 398140-57-3P        | 398140-59-5P | 398140-64-2P |
| 398140-69-7P | 398140-73-3P        | 398140-77-7P | 398140-78-8P |
| 398140-79-9P | 398140-81-3P        | 398140-86-8P | 398140-87-9P |
| 398140-88-0P | 398140-89-1P        | 398140-94-8P | 398141-00-9P |
| 398141-11-2P | 398141-13-4P        | 398141-14-5P | 405509-18-4P |
| 430436-66-1P | 430436-67-2P        | 430436-68-3P | 430436-70-7P |
| 430436-72-9P | 430436-74-1P        | 430436-76-3P | 430436-78-5P |
| 430436-79-6P | 430436-81-0P        | 430436-82-1P | 430436-84-3P |
| 430436-85-4P | 430436-86-5P        | 430436-87-6P | 430436-89-8P |
| 430436-90-1P | 430436-91-2P        | 430436-92-3P | 430436-94-5P |
| 430436-95-6P | 430436-97-8P        | 430436-98-9P | 430436-99-0P |
| 430437-09-5P | <b>430437-11-9P</b> | 430437-12-0P | 430437-13-1P |
| 430437-14-2P | 430437-15-3P        | 430437-17-5P | 430437-18-6P |
| 430437-19-7P | 430437-21-1P        | 430437-22-2P | 430437-24-4P |
| 431062-12-3P | 431062-14-5P        | 431062-16-7P | 431062-17-8P |
| 503003-64-3P | 503003-65-4P        |              |              |

(pos. photoresist compn. contg.)

L25 ANSWER 12 OF 20 HCA COPYRIGHT 2004 ACS on STN

138:178230 Fluorine-containing bicycloheptyl acrylates, their manufacture, their transparent polymers, and photoresists and antireflective materials using them. Kakuta, Shinichi; Komoritani, Haruhiko; Maeda, Kazuhiko (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003040926 A2 20030213, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-226582 20010726.

GI



I

AB The invention relates to F-contg. acrylates I (R = F, C<sub>1-10</sub>-fluorohydrocarbyl). The polymers may comprise other acrylates, norbornenes, styrene derivs., or vinyl ethers.

IT **496954-73-5P**

(F-contg. bicycloheptyl acrylates for transparent polymers for

photoresists and antireflective films)

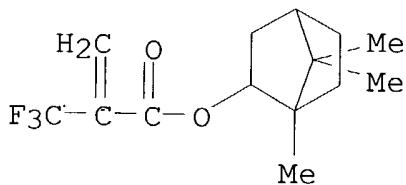
RN 496954-73-5 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol, 2,5-furandione and 1,7,7-trimethylbicyclo[2.2.1]hept-2-yl 2-(trifluoromethyl)-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 496954-69-9

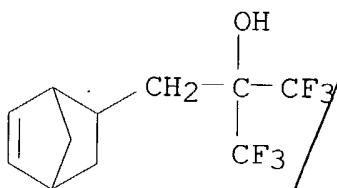
CMF C14 H19 F3 O2



CM 2

CRN 196314-61-1

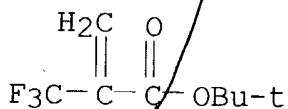
CMF C11 H12 F6 O



CM 3

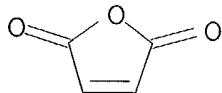
CRN 105935-24-8

CMF C8 H11 F3 O2



CM 4

CRN 108-31-6  
 CMF C4 H2 O3



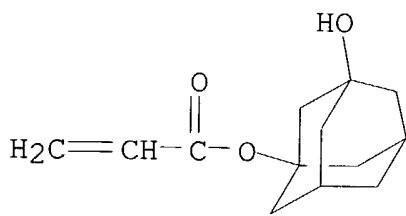
IC ICM C08F020-22  
 ICS C07C067-04; C07C069-653; G03F007-039  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 IT 496954-70-2P 496954-71-3P 496954-72-4P **496954-73-5P**  
 (F-contg. bicycloheptyl acrylates for transparent polymers for photoresists and antireflective films)

L25 ANSWER 13 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 138:145076 Chemically amplified positive-working photoresist composition. Araki, Kaori; Kuwana, Koji; Uetani, Yasunori (Sumitomo Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003043689 A2 (20030213, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-234648 20010802.  
 AB Title resist compn., suitable for use in ArF or KrF excimer laser lithog. and having good balance of resoln. and sensitivity, comprises an acid-forming agent and an alkali-insol. resin component which contains structural units derived from monomer ACH<sub>2</sub>(CR<sub>1</sub>R<sub>2</sub>)<sub>n</sub>CR<sub>3</sub>R<sub>4</sub>OH (A = 2-norbornen-5-yl; n = 0-4; R<sub>1</sub>, R<sub>2</sub> = H, C<sub>1</sub>-4 alkyl; R<sub>3</sub>, R<sub>4</sub> = C<sub>1</sub>-6 alkyl including at least one fluorine-substituted alkyl) and is becomes sol. in alkali by reacting with an acid.  
 IT **492470-60-7P**  
 (chem. amplified pos.-working photoresist compn. contg. photosensitive acid generator)  
 RN 492470-60-7 HCA  
 CN 2-Propenoic acid, 2-methyl-, 2-ethyltricyclo[3.3.1.13,7]dec-2-yl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol, 2,5-furandione and 3-hydroxytricyclo[3.3.1.13,7]dec-1-yl 2-propenoate (9CI) (CA INDEX NAME)

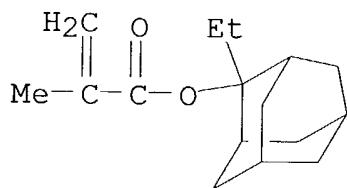
CM 1

CRN 216581-76-9  
 CMF C13 H18 O3

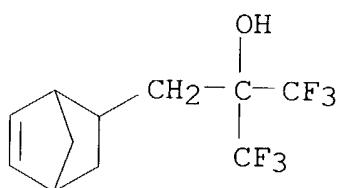
*Used  
 vs 2003/0068513  
 instead*



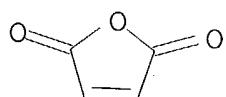
CM 2

CRN 209982-56-9  
CMF C16 H24 O2

CM 3

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 4

CRN 108-31-6  
CMF C4 H2 O3

IC ICM G03F007-039  
ICS C08F032-04; G03F007-004; H01L021-027  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)  
Section cross-reference(s): 76  
IT **492470-60-7P**  
(chem. amplified pos.-working photoresist compn. contg.  
photosensitive acid generator)

L25 ANSWER 14 OF 20 HCA COPYRIGHT 2004 ACS on STN  
138:9662 Negative photoresist composition for a method for fabricating a  
semiconductor device. Kozawa, Miwa; Nozaki, Koji; Watanabe, Keiji;  
Yano, Ei (Fujitsu Limited, Japan). U.S. Pat. Appl. Publ. US  
2002177070 A1 20021128, 24 pp., Cont.-in-part of U.S. Ser. No.  
785,306. (English). CODEN: USXXCO. APPLICATION: US 2002-97818  
20020315. PRIORITY: JP 2000-89790 20000328; US 2001-785306  
20010220; JP 2001-93727 20010328.

GI



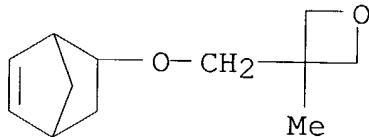
I

AB The present invention relates to a neg. photoresist compn. contg. an  
alk.-sol. resin as a base material, in which an oxetane structure  
represented by I is contained in a structure of the alk.-sol. resin  
or in a structure of a compd. used in combination with the alk.-sol.  
resin.  
IT **477327-49-4P**  
(neg. photoresist compn. for method for fabricating semiconductor  
device contg.)  
RN 477327-49-4 HCA  
CN 2,5-Furandione, polymer with 3-[(bicyclo[2.2.1]hept-5-en-2-  
yloxy)methyl]-3-methyloxetane and .alpha.,.alpha.-  
bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA  
INDEX NAME)

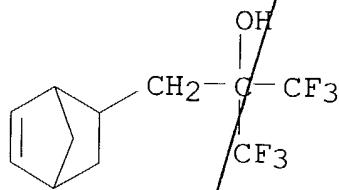
CM 1

CRN 477327-48-3

CMF C12 H18 O2



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 3

CRN 108-31-6  
CMF C4 H2 O3

IC ICM G03F007-038

ICS G03F007-075; G03F007-004; G03F007-11; G03F007-36; G03F007-30;  
G03F007-40

NCL 430270100; 430271100; 430325000; 430326000; 430311000; 430313000

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)

Section cross-reference(s): 35, 38, 76

IT 343615-46-3P 370588-70-8P 477327-40-5P 477327-41-6P  
477327-43-8P 477327-44-9P 477327-45-0P 477327-47-2P  
**477327-49-4P** 477327-50-7P 477327-51-8P 477327-52-9P  
477327-54-1P 477327-55-2P 477327-63-2P 477327-73-4P(neg. photoresist compn. for method for fabricating semiconductor  
device contg.)

L25 ANSWER 15 OF 20 HCA COPYRIGHT 2004 ACS on STN

136:409022 Positive resist composition. Aoai, Toshiaki; Yasunami, Shoichiro; Mizutani, Kazuyoshi; Kanna, Shinichi (Fuji Photo Film Co., Ltd., Japan). U.S. Pat. Appl. Publ. US 2002061464 A1 20020523, 56 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-961281 20010925. PRIORITY: JP 2000-292537 20000926; JP 2000-379284 20001213; JP 2001-62158 20010306; JP 2001-202298 20010703.

AB The present invention relates to a pos. resist compn. comprising: (A) a fluorine group-contg. resin having at least one fluorine atom on at least one of the main chain and the side chain of the polymer skeleton; and having a group capable of decompg. under the action of an acid to increase the solv. in an alkali developer; (B) a compd. capable of generating an acid upon irradn. with one of actinic ray and radiation; and (C) a surfactant contg. at least one of a silicon atom and a fluorine atom. The present invention provides a pos. photoresist compn. suitable for use in the microlithog. process in the prodn. of VLSI or high-capacity microchip, or in other photo-fabrication processes. The invention pos. photoresist compn. is capable of forming a highly definite pattern using a vacuum UV ray of < 160 nm.

IT 430437-11-9P

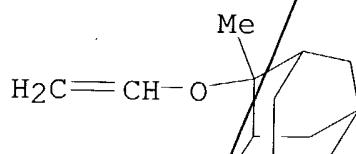
(fluorine group-contg. resin for pos. resist compn.)

RN 430437-11-9 HCA

CN 2,5-Furandione, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2-(ethenyloxy)-2-methyltricyclo[3.3.1.13,7]decane (9CI) (CA INDEX NAME)

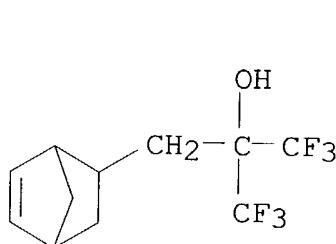
CM 1

CRN 430437-10-8  
CMF C13 H20 O

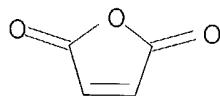


CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O



CM 3

CRN 108-31-6  
CMF C4 H2 O3

IC ICM G03F007-004

NCL 430270100

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 35, 38, 76

|    |              |              |              |                     |
|----|--------------|--------------|--------------|---------------------|
| IT | 262617-13-0P | 430436-66-1P | 430436-67-2P | 430436-68-3P        |
|    | 430436-70-7P | 430436-72-9P | 430436-74-1P | 430436-76-3P        |
|    | 430436-78-5P | 430436-79-6P | 430436-81-0P | 430436-82-1P        |
|    | 430436-84-3P | 430436-85-4P | 430436-86-5P | 430436-87-6P        |
|    | 430436-89-8P | 430436-90-1P | 430436-91-2P | 430436-92-3P        |
|    | 430436-94-5P | 430436-95-6P | 430436-97-8P | 430436-98-9P        |
|    | 430436-99-0P | 430437-01-7P | 430437-03-9P | 430437-04-0P        |
|    | 430437-05-1P | 430437-07-3P | 430437-09-5P | <b>430437-11-9P</b> |
|    | 430437-12-0P | 430437-13-1P | 430437-14-2P | 430437-15-3P        |
|    | 430437-17-5P | 430437-18-6P | 430437-19-7P | 430437-21-1P        |
|    | 430437-22-2P | 430437-24-4P | 430437-26-6P | 430437-27-7P        |
|    | 430437-29-9P | 430437-30-2P | 430437-32-4P | 430437-33-5P        |
|    | 430437-34-6P | 430437-35-7P | 430437-36-8P | 430437-37-9P        |
|    | 430437-38-0P | 430437-39-1P | 430437-40-4P | 430437-42-6P        |
|    | 430437-44-8P | 430437-46-0P | 431062-12-3P | 431062-14-5P        |
|    | 431062-16-7P | 431062-17-8P | 431062-18-9P | 431062-20-3P        |
|    | 431062-22-5P | 431062-24-7P | 431062-25-8P |                     |

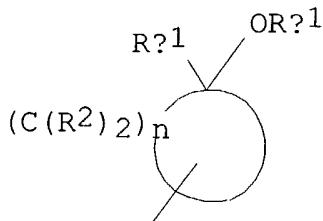
(fluorine group-contg. resin for pos. resist compn.)

L25 ANSWER 16 OF 20 HCA COPYRIGHT 2004 ACS on STN

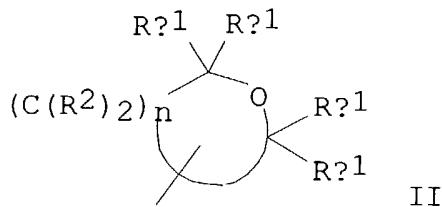
136:377479 High-molecular compounds for photoresists, monomeric compounds, photosensitive resin compositions, method for forming patterns with the compositions, and process for production of

electronic components. Shida, Naomi; Ushirogouchi, Toru; Naito, Takuya (Kabushiki Kaisha Toshiba, Japan). PCT Int. Appl. WO 2002036646 A1 20020510, 321 pp. DESIGNATED STATES: W: KR, US. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2001-JP9567 20011031. PRIORITY: JP 2000-332358 20001031; JP 2001-295012 20010926.

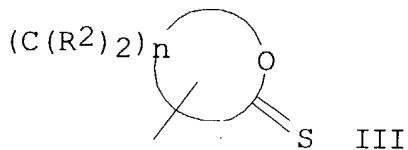
GI



I



II



III

AB High-mol. compds. for photoresists, each having at least one skeleton represented by the general formula  $-RC(Rx1)_2(ORx1)$ , I, II, or III:  $-RC(Rx1)_2(ORx1)$  I II III (R = alicyclic skeleton; Rx1 = electron-attracting group, H, monovalent org. group). The compds. shows small absorption towards  $\lambda \text{toreq.} 160$  nm light and provides the fine resist pattern of nanometer size and of the high etching resistance.

IT **424825-63-8P 424825-66-1P 424825-74-1P**  
(high-mol. compds. for photoresists)

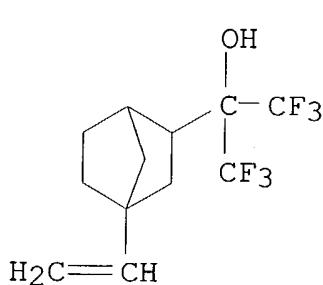
RN 424825-63-8 HCA

CN Bicyclo[2.2.1]heptane-2-methanol, 4-ethenyl-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 1-(1-butoxyethoxy)-4-ethenyl-1-(trifluoromethyl)cyclohexane (9CI) (CA INDEX NAME)

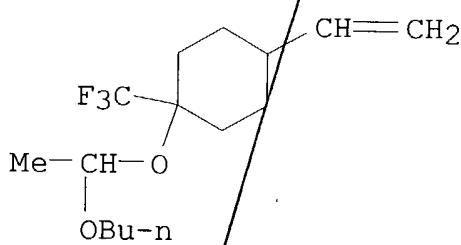
CM 1

CRN 424825-62-7

CMF C12 H14 F6 O



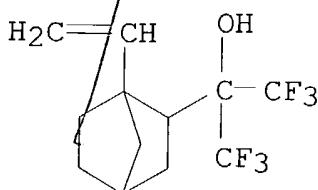
CM 2

CRN 424825-61-6  
CMF C15 H25 F3 O2

RN 424825-66-1 HCA

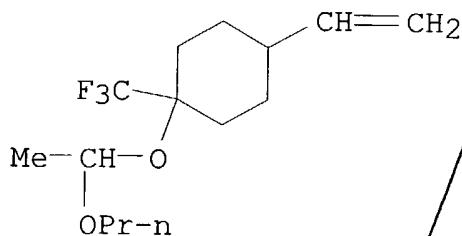
CN Bicyclo[2.2.1]heptane-2-methanol, 1-ethenyl-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 4-ethenyl-1-(1-propoxyethoxy)-1-(trifluoromethyl)cyclohexane (9CI) (CA INDEX NAME)

CM 1

CRN 424825-65-0  
CMF C12 H14 F6 O

CM 2

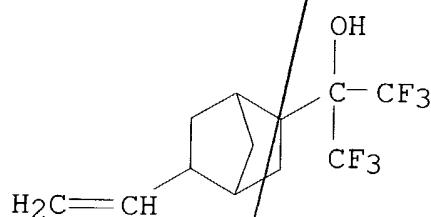
CRN 424825-64-9  
 CMF C14 H23 F3 O2



RN 424825-74-1 HCA  
 CN Bicyclo[2.2.1]heptane-2-methanol, 5-ethenyl-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 4-ethenyl-1-(1-methoxyethoxy)-1-(trifluoromethyl)cyclohexane (9CI) (CA INDEX NAME)

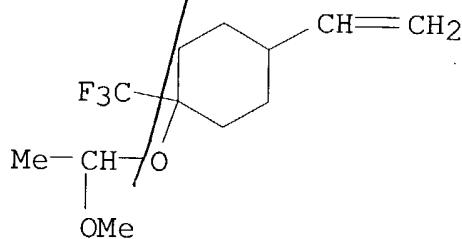
CM 1

CRN 424825-73-0  
 CMF C12 H14 F6 O



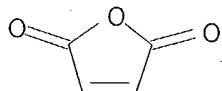
CM 2

CRN 424825-72-9  
 CMF C12 H19 F3 O2



IT 108-31-6, Maleic anhydride, reactions  
 (monomer of high-mol. compds. for photoresists)

RN 108-31-6 HCA  
 CN 2,5-Furandione (9CI) (CA INDEX NAME)



IC ICM C08F032-08  
 ICS G03F007-039  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 35

IT 424824-71-5P 424824-73-7P 424824-75-9P 424824-77-1P  
 424824-79-3P 424824-81-7P 424824-83-9P 424824-85-1P  
 424824-87-3P 424824-89-5P 424824-91-9P 424824-93-1P  
 424824-95-3P 424824-97-5P 424824-99-7P 424825-01-4P  
 424825-03-6P 424825-05-8P 424825-08-1P 424825-09-2P  
 424825-11-6P 424825-13-8P 424825-15-0P 424825-17-2P  
 424825-19-4P 424825-21-8P 424825-23-0P 424825-25-2P  
 424825-27-4P 424825-29-6P 424825-31-0P 424825-33-2P  
 424825-35-4P 424825-37-6P 424825-39-8P 424825-41-2P  
 424825-43-4P 424825-45-6P 424825-47-8P 424825-49-0P  
 424825-52-5P 424825-54-7P 424825-56-9P 424825-60-5P  
**424825-63-8P 424825-66-1P** 424825-70-7P  
**424825-74-1P** 424825-77-4P 424825-79-6P 424825-81-0P  
 424825-83-2P 424825-85-4P 424825-88-7P 424825-91-2P  
 424825-93-4P 424825-96-7P 424825-99-0P 424826-03-9P  
 424826-05-1P 424826-07-3P 424826-10-8P 424826-14-2P  
 424826-18-6P 424826-20-0P 424826-22-2P 424826-25-5P  
 424826-28-8P 424826-30-2P 424826-32-4P 424826-34-6P  
 424826-36-8P 424826-38-0P 424826-40-4P 424826-42-6P  
 424826-44-8P 424826-46-0P 424826-48-2P 424826-60-8P  
 424826-65-3P 424826-68-6P 424826-71-1P 424826-98-2P  
 424826-99-3P

(high-mol. compds. for photoresists)

IT 107-25-5, Methyl vinyl ether **108-31-6**, Maleic anhydride, reactions 109-92-2, Ethyl vinyl ether 110-87-2, Dihydropyran 111-34-2, Butyl vinyl ether 115-11-7, Isobutene, reactions 694-98-4, Bicyclo[2.2.1]hept-5-en-2-one 695-12-5, Vinylcyclohexane 764-47-6, Propyl vinyl ether 1740-64-3 3742-34-5, Vinylcyclopentane 3970-21-6, Methoxyethoxymethyl chloride 10218-02-7, Bicyclo[2.2.1]heptan-7-one 33613-18-2, Isopropenylcyclohexanone 34956-68-8, Bicyclo[3.2.1]oct-6-en-2-one 38078-09-0, (Diethylamino)sulfur trifluoride 58070-36-3 58070-37-4 165105-94-2, 3-Oxabicyclo[3.2.1]oct-6-ene-2,4-dione 424826-49-3, 1-Vinyl-4-oxoadamantane 424826-50-6 424826-51-7 424826-52-8 424826-53-9 424826-54-0 424826-55-1 424826-56-2

|             |             |             |             |             |
|-------------|-------------|-------------|-------------|-------------|
| 424826-57-3 | 424826-58-4 | 424826-61-9 | 424826-62-0 | 424826-63-1 |
| 424826-66-4 | 424826-69-7 | 424826-72-2 | 424826-73-3 | 424826-74-4 |
| 424826-75-5 | 424826-76-6 | 424826-77-7 | 424826-78-8 | 424826-79-9 |
| 424826-80-2 | 424826-81-3 | 424826-82-4 | 424826-83-5 | 424826-84-6 |
| 424826-85-7 | 424826-86-8 | 424826-87-9 | 424826-88-0 | 424826-89-1 |
| 424826-90-4 | 424826-91-5 | 424826-92-6 | 424826-93-7 | 424826-94-8 |
| 424827-00-9 |             |             |             |             |

(monomer of high-mol. compds. for photoresists)

L25 ANSWER 17 OF 20 HCA COPYRIGHT 2004 ACS on STN

136:224210 Negative resist composition and photolithographic process for manufacturing of electronic devices. Nozaki, Koji; Yano, Ei; Kozawa, Miwa (Fujitsu Limited, Japan). Eur. Pat. Appl. EP 1184723 A2 20020306, 47 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-307380 20010830. PRIORITY: JP 2000-266041 20000901; JP 2001-168630 20010604.

AB A neg. resist compn. is provided which comprises at least a constituent component which has a vinyl ether structure protected with an acetal in a mol. In the formation of neg. resist patterns, an aq. basic soln. can be used without swelling. A process is also provided for forming a resist pattern, which comprises the steps of: applying a neg. resist compn. comprising at least a constituent component which has a vinyl ether structure protected with an acetal in a mol., on a treated substrate; selectively exposing the formed resist film to imaging radiation capable of provoking decompn. of a photoacid generator of the resist compn., and developing the exposed resist film with an aq. basic soln. A process is also provided for manufg. an electronic device, which comprises the step of selectively removing an underlying treated substrate using a resist pattern, formed from the above-mentioned process, as a masking means to form a predetd. functional element layer.

IT 402751-22-8P  
(neg. resist compn. and photolithog. process for fabrication of MOS transistors and thin-film magnetic heads)

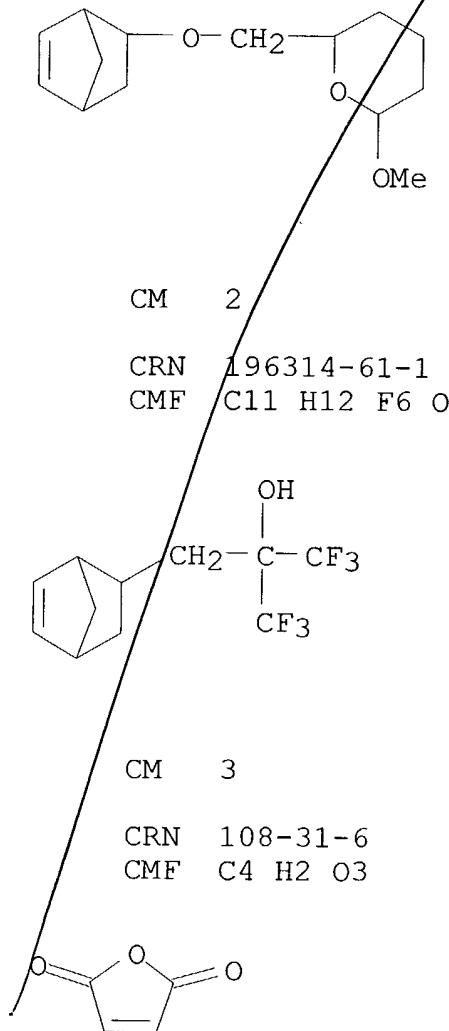
RN 402751-22-8 HCA

CN 2,5-Furandione, polymer with 2-[(bicyclo[2.2.1]hept-5-en-2-yloxy)methyl]tetrahydro-6-methoxy-2H-pyran and .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 402751-21-7

CMF C14 H22 O3



IC ICM G03F007-075  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 76  
 IT 33693-68-4DP, reaction products with 2-cyanoethyltrichlorosilane  
 hydrolytic homopolymer 181036-41-9DP, 2-Cyanoethyltrichlorosilane  
 hydrolytic homopolymer, reaction products with 2(3H)-Furanone,  
 3-bromodihydro-4-methyl- and 2-methoxy-6-bromomethyltetrahydropyran  
 402751-01-3P 402751-04-6P 402751-07-9P 402751-09-1P  
 402751-11-5P 402751-17-1P **402751-22-8P** 402751-28-4P  
 402751-34-2P 402751-50-2P 402751-54-6P 402751-56-8P  
 402751-59-1DP, reaction products with 2-cyanoethyltrichlorosilane  
 hydrolytic homopolymer 402755-85-5P 402758-23-0P  
 (neg. resist compn. and photolithog. process for fabrication of

MOS transistors and thin-film magnetic heads)

L25 ANSWER 18 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 136:45683 Radiation-sensitive resin composition for chem. amplified resist. Nishimura, Yukio; Yamahara, Noboru; Yamamoto, Masafumi; Kajita, Toru; Shimokawa, Tsutomu; Ito, Hiroshi (JSR Corporation, Japan; International Business Machines Corporation). Eur. Pat. Appl. EP 1164434 A2 20011219, 63 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-114503 20010615. PRIORITY: JP 2000-182297 20000616; JP 2001-108824 20010406.

AB A radiation-sensitive resin compn. comprising an acid-labile group-contg. resin and a photoacid generator is disclosed. The resin has a structure of X1R2COR1 (R1 = H, monovalent acid-labile group, C1-6 alkyl which does not have an acid-labile group, C2-7 alkylcarbonyl which does not have an acid-labile group; X1 = C1-4 fluorinated alkyl; and R2 = H, C1-10 alkyl, C1-10 fluorinated alkyl). The resin compn. exhibits high transmittance of radiation, high sensitivity, resoln., and pattern shape, and is useful as a chem. amplified resist in producing semiconductors at a high yield.

IT 380886-63-5P 380886-66-8P 380886-68-0P  
 380886-69-1P 380886-70-4P 380886-71-5P  
 380886-78-2P 380886-79-3P 380886-80-6P

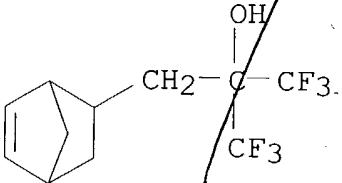
(acid-labile group-contg. resin for radiation-sensitive resist compn.)

RN 380886-63-5 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
 CMF C11 H12 F6 O

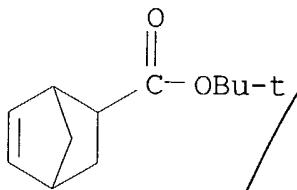


6800414  
 20020009668

CM 2

CRN 154970-45-3

CMF C12 H18 O2



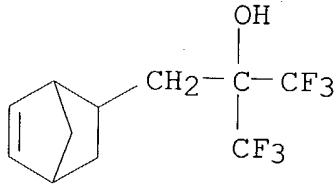
CM

CRN 108-31-6  
CMF C4 H2 O3

RN 380886-66-8 HCA

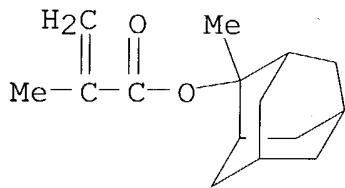
CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.13,7]dec-2-yl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

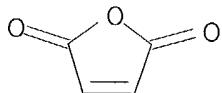
CRN 196314-61-1  
CMF C11 H12 F6 O

CM 2

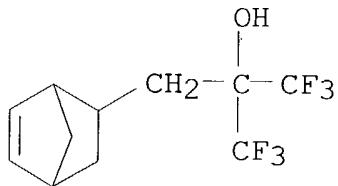
CRN 177080-67-0  
CMF C15 H22 O2



CM 3

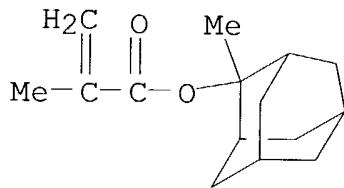
CRN 108-31-6  
CMF C4 H2 O3RN 380886-68-0 HCA  
CN 2-Propenoic acid, 2-methyl-, 2-methyltricyclo[3.3.1.13,7]dec-2-yl ester, polymer with bicyclo[2.2.1]hept-2-ene, .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

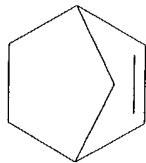
CRN 196314-61-1  
CMF C11 H12 F6 O

CM 2

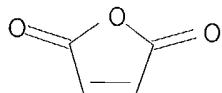
CRN 177080-67-0  
CMF C15 H22 O2



CM 3

CRN 498-66-8  
CMF C7 H10

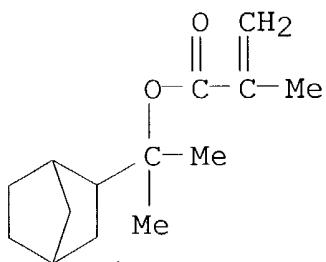
CM 4

CRN 108-31-6  
CMF C4 H2 O3

RN 380886-69-1 HCA  
 CN 2-Propenoic acid, 2-methyl-, 1-bicyclo[2.2.1]hept-2-yl-1-methylethyl ester, polymer with bicyclo[2.2.1]hept-2-ene, .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,5-furandione (9CI) (CA INDEX NAME)

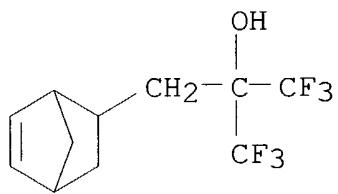
CM 1

CRN 342014-18-0  
CMF C14 H22 O2



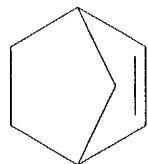
CM 2

CRN 196314-61-1  
 CMF C11 H12 F6 O



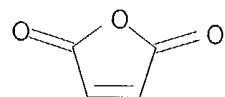
CM 3

CRN 498-66-8  
 CMF C7 H10



CM 4

CRN 108-31-6  
 CMF C4 H2 O3



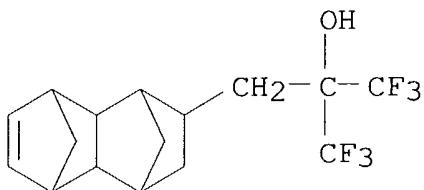
RN 380886-70-4 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with 2,5-furandione and 1,2,3,4,4a,5,8,8a-octahydro-.alpha.,.alpha.-bis(trifluoromethyl)-1,4:5,8-dimethanonaphthalene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 365533-00-2

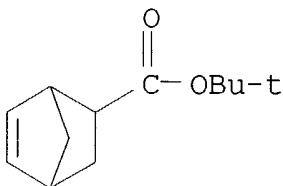
CMF C16 H18 F6 O



CM 2

CRN 154970-45-3

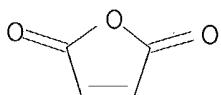
CMF C12 H18 O2



CM 3

CRN 108-31-6

CMF C4 H2 O3



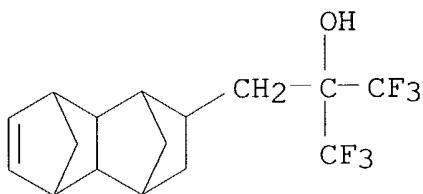
RN 380886-71-5 HCA

CN 2-Propenoic acid, 2-methyl-, 1-bicyclo[2.2.1]hept-2-yl-1-methylethyl ester, polymer with bicyclo[2.2.1]hept-2-ene, 2,5-furandione and

1,2,3,4,4a,5,8,8a-octahydro-.alpha.,.alpha.-bis(trifluoromethyl)-  
1,4:5,8-dimethanonaphthalene-2-ethanol (9CI) (CA INDEX NAME)

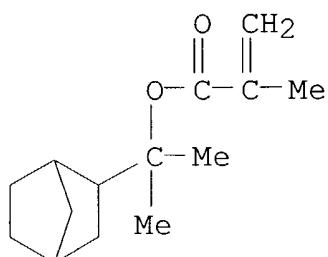
CM 1

CRN 365533-00-2  
CMF C16 H18 F6 O



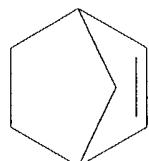
CM 2

CRN 342014-18-0  
CMF C14 H22 O2



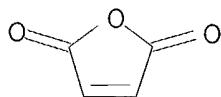
CM 3

CRN 498-66-8  
CMF C7 H10



CM 4

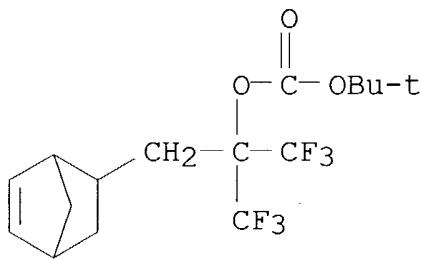
CRN 108-31-6  
 CMF C4 H2 O3



RN 380886-78-2 HCA  
 CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,5-furandione (9CI) (CA INDEX NAME)

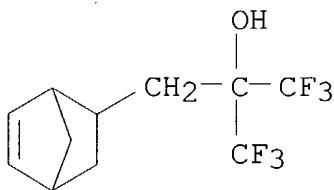
CM 1

CRN 196314-63-3  
 CMF C16 H20 F6 O3



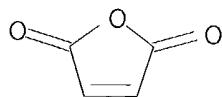
CM 2

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 3

CRN 108-31-6  
 CMF C4 H2 O3



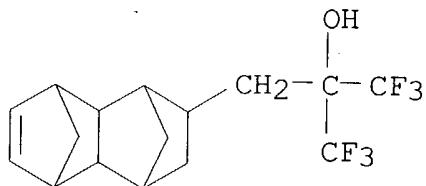
RN 380886-79-3 HCA

CN Carbonic acid, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethyl)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl 1,1-dimethylethyl ester, polymer with 2,5-furandione and 1,2,3,4,4a,5,8,8a-octahydro-.alpha.,.alpha.-bis(trifluoromethyl)-1,4:5,8-dimethanonaphthalene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 365533-00-2

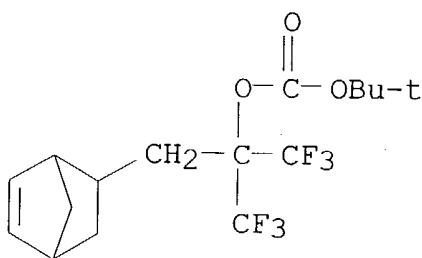
CMF C16 H18 F6 O



CM 2

CRN 196314-63-3

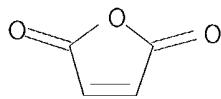
CMF C16 H20 F6 O3



CM 3

CRN 108-31-6

CMF C4 H2 O3



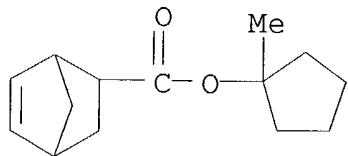
RN 380886-80-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-methylcyclopentyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

CRN 369648-89-5

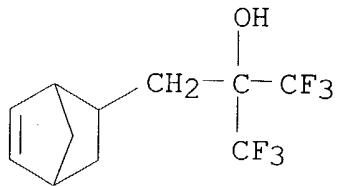
CMF C14 H20 O2



CM 2

CRN 196314-61-1

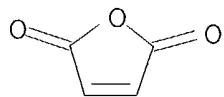
CMF C11 H12 F6 O



CM 3

CRN 108-31-6

CMF C4 H2 O3



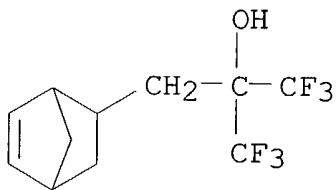
IC ICM G03F007-004

ICS G03F007-039  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 IT Section cross-reference(s): 35, 38, 76  
 370099-14-2P 370102-83-3P 380886-62-4P **380886-63-5P**  
**380886-66-8P 380886-68-0P 380886-69-1P**  
**380886-70-4P 380886-71-5P** 380886-72-6DP,  
 hydrogenated 380886-72-6P 380886-73-7DP, hydrogenated  
 380886-74-8DP, hydrogenated 380886-74-8P 380886-75-9DP,  
 hydrogenated 380886-76-0DP, hydrogenated 380886-76-0P  
 380886-77-1DP, hydrogenated **380886-78-2P**  
**380886-79-3P 380886-80-6P** 380886-81-7P  
 380886-82-8P 380886-83-9P 380915-67-3P  
 (acid-labile group-contg. resin for radiation-sensitive resist  
 compn.)

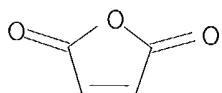
L25 ANSWER 19 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 135:218727 Resist materials for 157-nm lithography. Fedynyshyn,  
 Theodore H. (Massachusetts Institute of Technology, Inc., USA). PCT  
 Int. Appl. WO 2001063362 A2 20010830, 43 pp. DESIGNATED STATES: W:  
 CA, JP; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,  
 MC, NL, PT, SE, TR. (English). CODEN: PIXXD2. APPLICATION: WO  
 2001-US5907 20010226. PRIORITY: US 2000-513792 20000225.  
 AB The invention relates to photoresist materials useful in  
 microlithog. and to improved materials and methods for pattern  
 formation on semiconductor wafers. A radiation sensitive resin  
 compn. including a photo-acid generator and an aliph. polymer having  
 .gtoreq.1 electron withdrawing groups adjacent to or attached to a C  
 atom bearing a protected hydroxyl group, wherein the protecting  
 group is labile in the presence of in situ generated acid is  
 described. The radiation sensitive resin compn. can be used as a  
 resist suitable for image transfer by plasma etching and enable 1 to  
 obtain an etching image having high precision with high  
 reproducibility with a high degree of resoln. and selectivity.  
 IT **357397-09-2D**, functional-group protected  
 (pos. photoresist compn. for 157-nm lithog. using)  
 RN 357397-09-2 HCA  
 CN 2,5-Furandione, polymer with .alpha.,.alpha.-  
 bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA  
 INDEX NAME)

CM 1

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 2

CRN 108-31-6  
CMF C4 H2 O3

IC ICM G03F007-00  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 IT 25211-99-8D, functional-group protected 25568-84-7D,  
 Cyclopentadiene homopolymer, reaction products with  
 hexafluoroacetone, functional-group protected 219552-58-6D,  
 functional-group protected 357397-03-6 357397-04-7D,  
 functional-group protected 357397-05-8D, functional-group  
 protected 357397-06-9D, functional-group protected 357397-07-0D,  
 functional-group protected 357397-08-1D, functional-group  
 protected 357397-09-2D, functional-group protected  
 357397-11-6D, functional-group protected 357397-12-7D,  
 functional-group protected  
 (pos. photoresist compn. for 157-nm lithog. using)

L25 ANSWER 20 OF 20 HCA COPYRIGHT 2004 ACS on STN  
 134:200382 Negative-tone 193-nm resists. Cho, Sungseo; Vander Heyden,  
 Anthony; Byers, Jeffrey D.; Willson, C. Grant (Univ. of Texas at  
 Austin, Austin, TX, USA). Proceedings of SPIE-The International  
 Society for Optical Engineering, 3999(Pt. 1, Advances in Resist  
 Technology and Processing XVII), 62-73 (English) 2000. CODEN:  
 PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society  
 for Optical Engineering.

AB A great deal of progress has been made in the design of single layer  
 pos. tone resists for 193 nm lithog. Com. samples of such materials  
 are now available from many vendors. The patterning of certain  
 levels of devices profits from the use of neg. tone resists. There  
 have been several reports of work directed toward the design of neg.

tones resists for 193 nm exposure but, none have performed as well as the pos. tone systems. Polymers with alicyclic structures in the backbone have emerged as excellent platforms from which to design pos. tone resists for 193 nm exposure. The authors report the adaptation of this class of polymers to the design of high performance neg. tone 193 nm resists. New systems have been prepd. that are based on a polarity switch mechanism for modulation of the dissoln. rate. The systems are based on a polar, alicyclic polymer backbone that includes a monomer bearing a glycol pendant group that undergoes the acid catalyzed pinacol rearrangement upon exposure and bake to produce the corresponding less polar ketone. This monomer was copolymd. with maleic anhydride and a norbornene bearing a bis-trifluoromethylcarbinol. The rearrangement of the copolymer was monitored by FT-IR as a function of temp. The synthesis of the norbornene monomers will be presented together with characterization of copolymers of these monomers with maleic anhydride. The lithog. performance of the new resist system will also be presented.

IT

**327610-81-1P**

(photoresist for 193 nm lithog. contg. terpolymer of maleic anhydride and norbornene with bis-trifluoromethylcarbinol and norbornene with glycol pendant group that undergoes acid catalyzed pinacol rearrangement)

RN

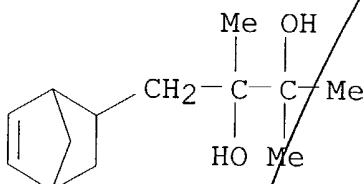
327610-81-1 HCA

CN

2,5-Furandione, polymer with 1-bicyclo[2.2.1]hept-5-en-2-yl-2,3-dimethyl-2,3-butanediol and .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

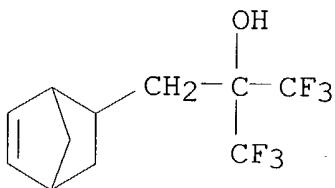
CM 1

CRN 327610-80-0  
CMF C13 H22 O2

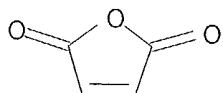


CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O



CM 3

CRN 108-31-6  
CMF C4 H2 O3

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 327610-81-1P 327610-82-2P

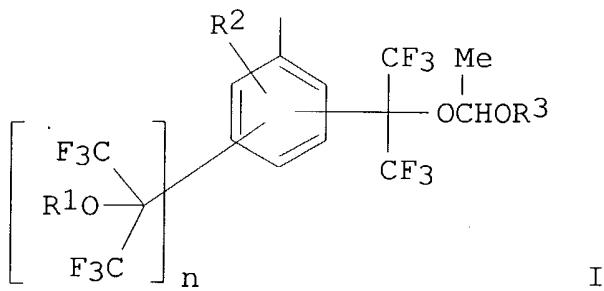
(photoresist for 193 nm lithog. contg. terpolymer of maleic anhydride and norbornene with bis-trifluoromethylcarbinol and norbornene with glycol pendant group that undergoes acid catalyzed pinacol rearrangement)

=&gt; d 126 1-16 cbib abs hitstr hitind

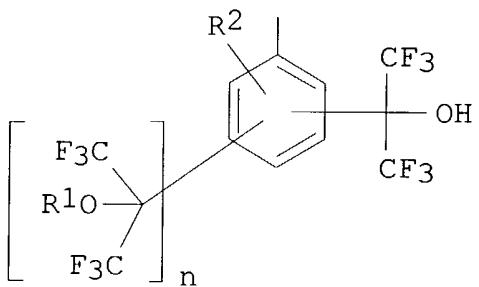
L26 ANSWER 1 OF 16 HCA COPYRIGHT 2004 ACS on STN

141:285804 Fluorine compounds bearing acid-labile groups, their manufacture, and photoresists, and pattern forming method using the photoresists. Yamaoka, Tsugio; Maeda, Kazuhiko (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2004256562 A2 20040916, 21 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2003-45329 20030224.

GI



I



II

AB The compds. bearing  $\text{CO}_2\text{CHMeOR}_3$  and/or substituted Ph I (R1, R3 = H, alkyl, arom. group, alicyclic group-contg. hydrocarbyl; R1 and R3 may contain F, O, N, carbonyl, **alc.**; R2 = H, F, Me, CF3; n = 0, 1) are manufd. by treatment of fluorine compds. bearing  $\text{CO}_2\text{H}$  or II (R1, R2 = same as I) with vinyl ethers. Photoresists contg. the compds. show good vacuum-UV transparency and etching resistance.

IT 754211-80-8DP, A-F copolymer ester with 3,3,4,4,5,5,6,6,6-nonafluorohexyl vinyl ether 754211-83-1P

754211-86-4P 754211-90-0P 754213-51-9P

(manuf. of fluorine compds. bearing acid-labile groups and showing good etching resistance for vacuum-UV photoresists)

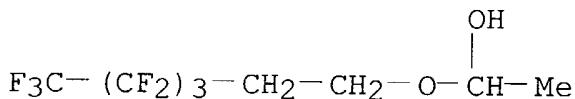
RN 754211-80-8 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol, 1-[(3,3,4,4,5,5,6,6,6-nonafluorohexyl)oxy]ethyl ester (9CI) (CA INDEX NAME)

CM 1

CRN 754211-79-5

CMF C8 H9 F9 O2

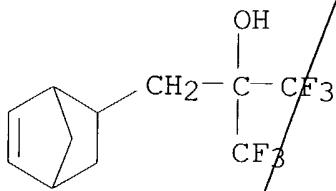


CM 2

CRN 478548-62-8  
 CMF (C11 H12 F6 O C4 H3 F3 O2)x  
 CCI PMS

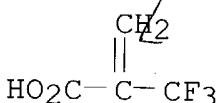
CM 3

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 4

CRN 381-98-6  
 CMF C4 H3 F3 O2

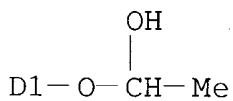
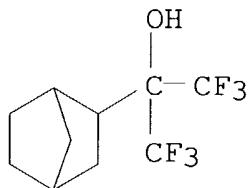


RN 754211-83-1 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, polymer with  
 5-(ethenyloxy)-1,1,2,2,3,3,3a,7a-octafluoroctahydro-4,7-methano-1H-indene, 5-(ethenyloxy)-.alpha.,.alpha.,.alpha.',.alpha.'-tetrakis(trifluoromethyl)-1,3-cyclohexanedimethanol and 5(or 6)-[3,3,3-trifluoro-2-hydroxy-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-yl 2-(trifluoromethyl)-2-propenoate, 1-[[5(or 6)-[2,2,2-trifluoro-1-hydroxy-1-(trifluoromethyl)ethyl]bicyclo[2.2.1]hept-2-yl]oxy]ethyl ester (9CI) (CA INDEX NAME)

CM 1

CRN 754211-82-0  
 CMF C12 H16 F6 O3  
 CCI IDS

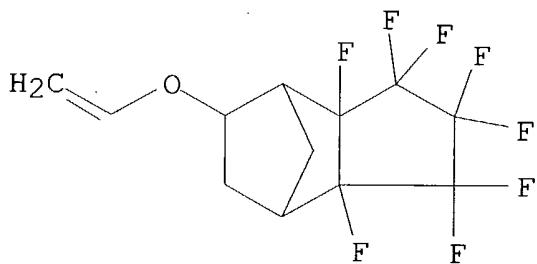


CM 2

CRN 754211-81-9  
 CMF (C15 H15 F9 O3 . C14 H14 F12 O3 . C12 H10 F8 O . C4 H3 F3 O2)x  
 CCI PMS

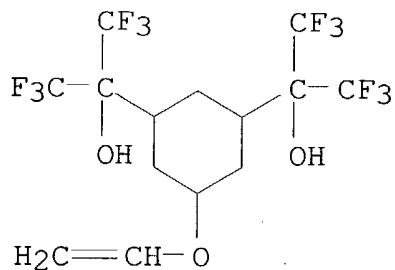
CM 3

CRN 691870-36-7  
 CMF C12 H10 F8 O

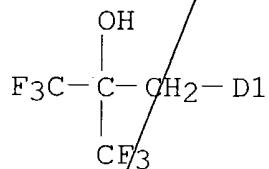
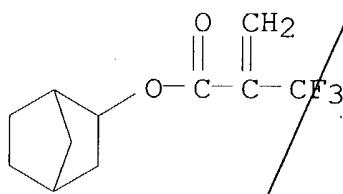


CM 4

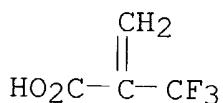
CRN 691410-53-4  
 CMF C14 H14 F12 O3



CM 5  
 CRN 585571-44-4  
 CMF C15 H15 F9 O3  
 CCI IDS



CM 6  
 CRN 381-98-6  
 CMF C4 H3 F3 O2

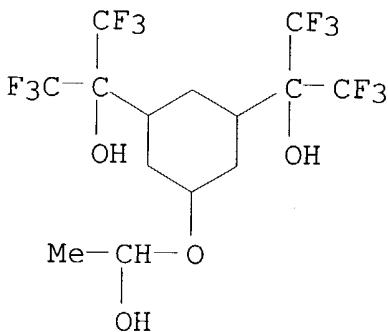


RN 754211-86-4 HCA  
 CN 2-Propenoic acid, 2-(trifluoromethyl)-, polymer with  
 .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-

ethanol, 5-(ethenyloxy)-1,1,2,2,3,3,3a,7a-octafluorooctahydro-4,7-methano-1H-indene and tetrafluoroethene, 1-[[3,5-bis[2,2,2-trifluoro-1-hydroxy-1-(trifluoromethyl)ethyl]cyclohexyl]oxy]ethyl ester (9CI) (CA INDEX NAME)

CM 1

CRN 754211-85-3  
CMF C14 H16 F12 O4

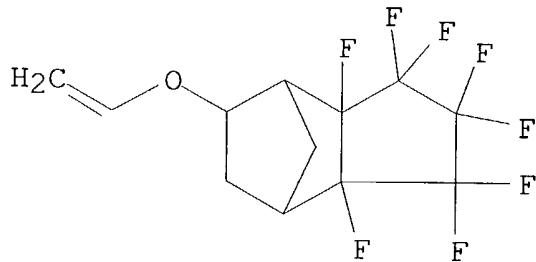


CM 2

CRN 754211-84-2  
CMF (C12 H10 F8 O . C11 H12 F6 O . C4 H3 F3 O2 . C2 F4)x  
CCI PMS

CM 3

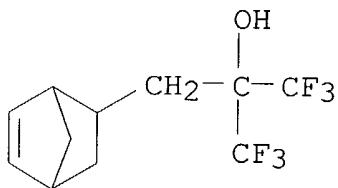
CRN 691870-36-7  
CMF C12 H10 F8 O



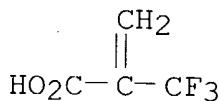
CM 4

CRN 196314-61-1

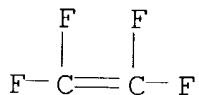
CMF C11 H12 F6 O



CM 5

CRN 381-98-6  
CMF C4 H3 F3 O2

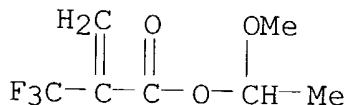
CM 6

CRN 116-14-3  
CMF C2 F4

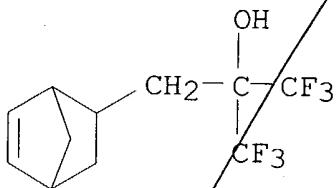
RN 754211-90-0 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1-methoxyethyl ester,  
polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-  
5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 753491-16-6  
CMF C7 H9 F3 O3

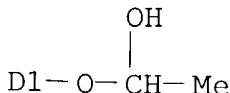
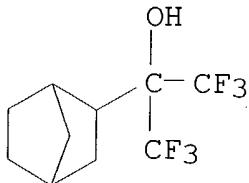
CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

RN 754213-51-9 HCA

CN 2-Propenoic acid, 2-methyl-, polymer with 2-methyltricyclo[3.3.1.13,7]dec-2-yl 2-methyl-2-propenoate, tetrahydro-5-oxo-3-furanyl 2-methyl-2-propenoate and 5(or 6)-[3,3,3-trifluoro-2-hydroxy-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-yl 2-methyl-2-propenoate, 1-[[5(or 6)-[2,2,2-trifluoro-1-hydroxy-1-(trifluoromethyl)ethyl]bicyclo[2.2.1]hept-2-yl]oxy]ethyl ester (9CI) (CA INDEX NAME)

CM 1

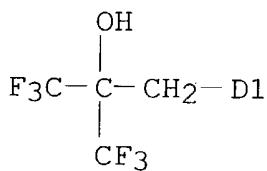
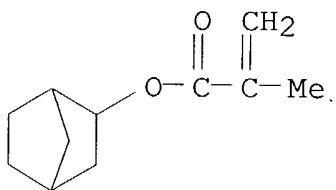
CRN 754211-82-0  
CMF C12 H16 F6 O3  
CCI IDS

CM 2

CRN 754213-50-8  
CMF (C15 H22 O2 . C15 H18 F6 O3 . C8 H10 O4 . C4 H6 O2)x  
CCI PMS

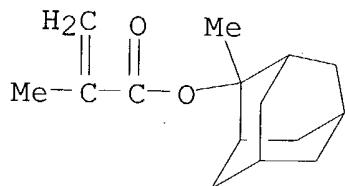
CM 3

CRN 585578-37-6  
 CMF C15 H18 F6 O3  
 CCI IDS



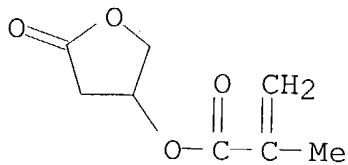
CM 4

CRN 177080-67-0  
 CMF C15 H22 O2

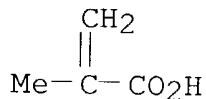


CM 5

CRN 130224-95-2  
 CMF C8 H10 O4



CM 6

CRN 79-41-4  
CMF C4 H6 O2

IC ICM C08F008-00

CC ICS C08F012-22; C08F020-22; C08F032-08; G03F007-039; H01L021-027  
74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)

IT Section cross-reference(s): 23, 35, 38

107-25-5DP, Methyl vinyl ether, reaction products with fluoropolymer  
753491-15-5DP, reaction products with Me vinyl ether754211-80-8DP, A-F copolymer ester with 3,3,4,4,5,5,6,6,6-  
nonafluorohexyl vinyl ether 754211-83-1P

754211-86-4P 754211-90-0P 754211-96-6P

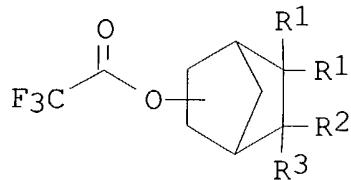
754213-51-9P

(manuf. of fluorine compds. bearing acid-labile groups and  
showing good etching resistance for vacuum-UV photoresists)

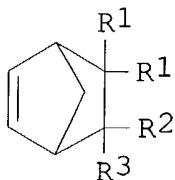
L26 ANSWER 2 OF 16 HCA COPYRIGHT 2004 ACS on STN

141:277786 Production processes for the preparation of  
fluorine-containing cyclic esters and **alcohols** from cyclic  
alkenes. Kobayashi, Satoru; Kawamura, Katsunori; Komoriya,  
Haruhiko; Maeda, Kazuhiko (Central Glass Company, Ltd., Japan).  
U.S. Pat. Appl. Publ. US 2004180954 A1 20040916, 5 pp. (English).  
CODEN: USXXCO. APPLICATION: US 2004-787964 20040227. PRIORITY: JP  
2003-6433 20030311.

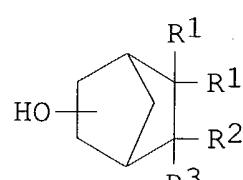
GI



I



II



III

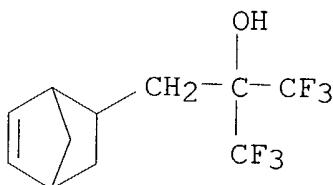
AB A fluorine-contg. cyclic ester I [R1 = H, F; R2 = H, F, CF3, OH, COOH, COOR4; R3 = F, CF3, R5C(CF3)2OR6 {esp., CH2C(CF3)2OH}; R4 = C1-15-alkyl; ; R5 = CH2, C2H4, OCH2; R6 = H, an acid-labile protecting group {e.g., Boc, CH2OMe, 2-methyl-2-adamantyl ester, 2-ethyl-2-adamantyl ester}] is described. A process for producing I is characterized by reacting a fluorine-contg. norbornene II with trifluoroacetic acid. Also disclosed, is a process for producing bicyclic **alcs.** III by hydrolyzing I. Thus, I [R1 = R2 = H, R3 = CH2C(CF3)2OH] was prep'd. from II [R1 = R2 = H, R3 = CH2C(CF3)2OH] by treatment with CF3CO2H in PhMe; I was then hydrolyzed to III [R1 = R2 = H, R3 = CH2C(CF3)2OH] by treatment with NaOH in aq. MeOH followed by acidification with aq. HCl.

IT 196314-61-1

(acetoxylation of, by trifluoroacetic acid; prepn. of fluorine-contg. cyclic esters and **alcs.** from alkenes)

RN 196314-61-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)

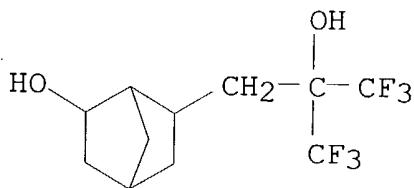


IT 496064-80-3P 757957-38-3P

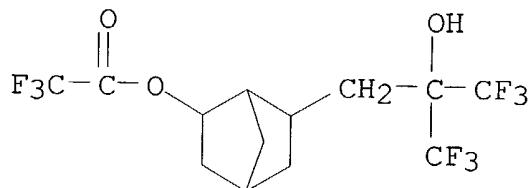
(prepn. and deacetylation of; prepn. of fluorine-contg. cyclic esters and **alcs.** from alkenes)

RN 496064-80-3 HCA

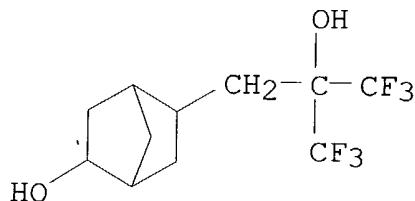
CN Bicyclo[2.2.1]heptane-2-ethanol, 6-hydroxy-.alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



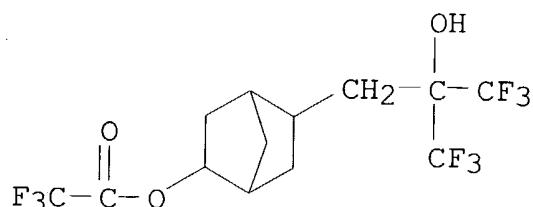
RN 757957-38-3 HCA  
 CN INDEX NAME NOT YET ASSIGNED



IT 630414-93-6P 757957-39-4P  
 (prepn. of fluorine-contg. cyclic esters and **alcs.** from  
 alkenes)  
 RN 630414-93-6 HCA  
 CN Bicyclo[2.2.1]heptane-2-ethanol, 5-hydroxy-.alpha.,.alpha.-  
 bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 757957-39-4 HCA  
 CN INDEX NAME NOT YET ASSIGNED



IC ICM C07C069-63

NCL ICS A01N043-62; A01N037-02  
 514550000; 560227000  
 CC 30-10 (Terpenes and Terpenoids)  
 Section cross-reference(s): 23  
 ST fluorine contg bicyclic ester prepn; bicyclic **alc** fluorine  
 contg prepn; alkene bicyclic acetoxylation trifluoroacetic acid;  
 cycloalkene bicyclic acetoxylation trifluoroacetic acid  
 IT Bicyclic compounds  
 Monoterpenes  
 (esters and **alcs.**; prepn. of fluorine-contg. cyclic  
 esters and **alcs.** from alkenes)  
 IT Acetoxylation  
 (of norbornenes by trifluoroacetic acid; prepn. of  
 fluorine-contg. cyclic esters and **alcs.** from alkenes)  
 IT Addition reaction  
 (of trifluoroacetic acid to norbornenes; prepn. of  
 fluorine-contg. cyclic esters and **alcs.** from alkenes)  
 IT 196314-61-1  
 (acetoxylation of, by trifluoroacetic acid; prepn. of  
 fluorine-contg. cyclic esters and **alcs.** from alkenes)  
 IT 76-05-1, Trifluoroacetic acid, reactions  
 (addn. of, to fluorine-contg. norbornenes; prepn. of  
 fluorine-contg. cyclic esters and **alcs.** from alkenes)  
 IT 496064-80-3P 757957-38-3P  
 (prepn. and deacetylation of; prepn. of fluorine-contg. cyclic  
 esters and **alcs.** from alkenes)  
 IT 630414-93-6P 757957-39-4P  
 (prepn. of fluorine-contg. cyclic esters and **alcs.** from  
 alkenes)

L26 ANSWER 3 OF 16 HCA COPYRIGHT 2004 ACS on STN

141:261444 Vinyl addition polycyclic olefin polymers prepared with  
 non-olefinic chain transfer agents and their uses in photoresist.  
 Rhodes, Larry F.; Barnes, Dennis A.; Bell, Andrew; Bennett, Brian  
 K.; Chang, Chung; Lipian, John-Henry; Wu, Xiaoming (Promerus Llc,  
 USA). PCT Int. Appl. WO 2004076495 A2 20040910, 87 pp. DESIGNATED  
 STATES: W: AE, AE, AG, AL, AL, AM, AM, AM, AT, AT, AU, AZ, AZ, BA,  
 BB, BG, BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR,  
 CR, CU, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EC, EC, EE, EE, EG, ES,  
 ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN, IS,  
 JP, JP, KE, KE, KG, KG, KP, KP, KP, KR, KR, KZ, KZ, KZ, LC, LK, LR,  
 LS, LS, LT, LU, LV, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ, NA,  
 NI; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR,  
 GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, BF,  
 BJ, CF, CG, CI, CM, GA, ML, MR, NE, SN, TD, TG, TR. (English).  
 CODEN: PIXXD2. APPLICATION: WO 2004-US5002 20040220. PRIORITY: US  
 2003-PV448939 20030221; US 2004-782547 20040219.

AB The invention relates to a method of polymg. poly(cyclic)olefin

monomers encompassing: (a) combining a monomer compn. contg. the poly(cyclic)olefin monomers, a non-olefinic chain transfer agent and an activator compd. to form a mixt.; (b) heating the mixt.; and (c) adding a polymn. catalyst contg. Ni and/or Pd. The non-olefinic chain transfer agent includes one or more compds. selected from H<sub>2</sub>, alkylsilanes, alkylalkoxysilanes, alkylgermanes, alkylalkoxygermanes, alkylstannanes, and alkylalkoxystannanes. The activator is characterized as having an active hydrogen with a pKa of at least 5. The resulting poly(cyclic)olefin polymers can be used in photoresist compns.

IT 370099-14-2P 409305-68-6P 754231-22-6P  
 754231-23-7P 754231-24-8P 754231-26-0P  
 754231-28-2P

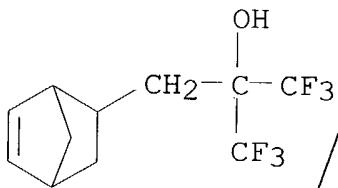
(vinyl addn. polycyclic olefin polymers prep'd. with non-olefinic chain transfer agents and their uses in photoresist)

RN 370099-14-2 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

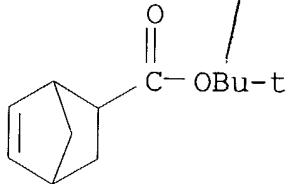
CM 1

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 2

CRN 154970-45-3  
 CMF C12 H18 O2

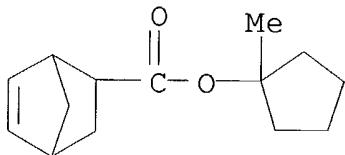


RN 409305-68-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1-methylcyclopentyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and tetrahydro-2-oxo-3-furanyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI) (CA INDEX NAME)

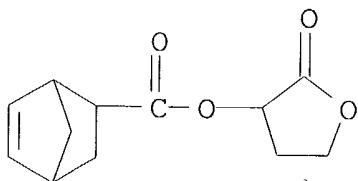
CM 1

CRN 369648-89-5  
 CMF C14 H20 O2



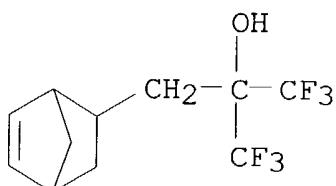
CM 2

CRN 264193-09-1  
 CMF C12 H14 O4



CM 3

CRN 196314-61-1  
 CMF C11 H12 F6 O



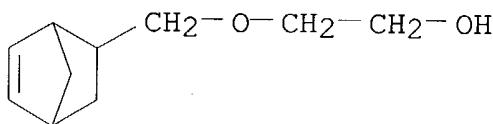
RN 754231-22-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 2-(bicyclo[2.2.1]hept-5-en-2-

ylmethoxy)ethanol (9CI) (CA INDEX NAME)

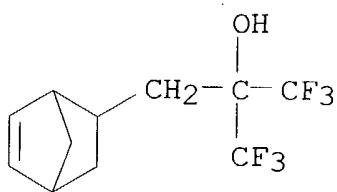
CM 1

CRN 754231-21-5  
CMF C10 H16 O2



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

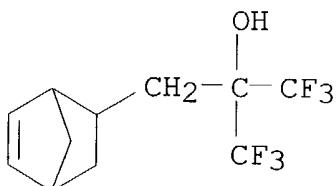


RN 754231-23-7 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-hydroxyethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

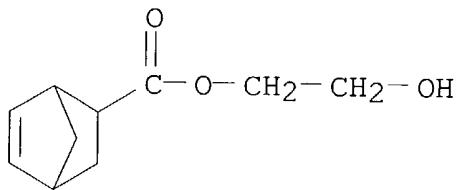
CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O



CM 2

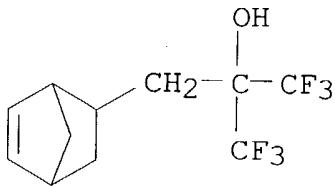
CRN 37503-42-7  
 CMF C10 H14 O3



RN 754231-24-8 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-hydroxyethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and trimethylsilyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI) (CA INDEX NAME)

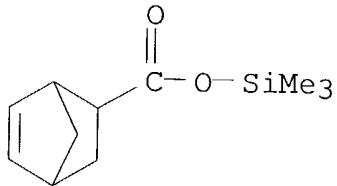
CM 1

CRN 196314-61-1  
 CMF C11 H12 F6 O



CM 2

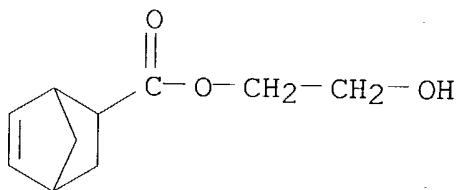
CRN 56151-01-0  
 CMF C11 H18 O2 Si



CM 3

CRN 37503-42-7

CMF C10 H14 O3



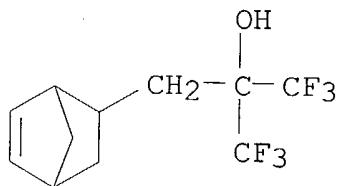
RN 754231-26-0 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with bicyclo[2.2.1]hept-5-ene-2-methanol (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

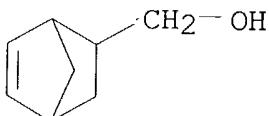
CMF C11 H12 F6 O



CM 2

CRN 95-12-5

CMF C8 H12 O



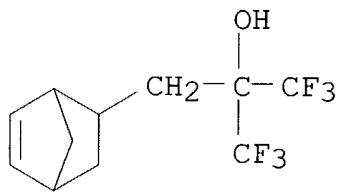
RN 754231-28-2 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, trimethylsilyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

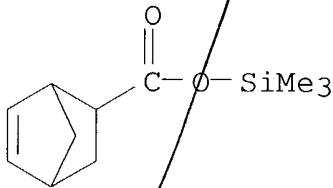
CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



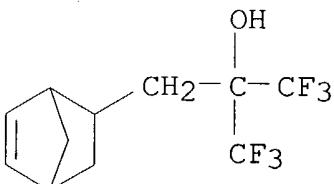
CM 2

CRN 56151-01-0  
CMF C11 H18 O2 SiIT 357397-07-0P, .alpha.,.alpha.-Bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol homopolymer  
(vinyl addn. polycyclic olefin polymers prep'd. with non-olefinic chain transfer agents and uses thereof)

RN 357397-07-0 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O

IC ICM C08F

CC 37-3 (Plastics Manufacture and Processing)  
Section cross-reference(s): 38, 76, 78

IT **Alcohols, uses**

(activators; vinyl addn. polycyclic olefin polymers prep'd. with non-olefinic chain transfer agents and their uses in photoresist)

IT 146066-36-6P, Norbornene;5-triethoxysilylnorbornene copolymer  
**370099-14-2P 409305-68-6P 754231-22-6P**  
**754231-23-7P 754231-24-8P 754231-25-9P**  
**754231-26-0P 754231-27-1P 754231-28-2P**

(vinyl addn. polycyclic olefin polymers prep'd. with non-olefinic chain transfer agents and their uses in photoresist)

IT **357397-07-0P, .alpha.,.alpha.-Bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol homopolymer**

(vinyl addn. polycyclic olefin polymers prep'd. with non-olefinic chain transfer agents and uses thereof)

L26 ANSWER 4 OF 16 HCA COPYRIGHT 2004 ACS on STN

141:251431 Dissolution rate modifiers for photoresist compositions.

Rhodes, Larry F.; Seger, Larry; Goodall, Brian L.; McIntosh, Lester H., III; Duff, Robert J. (Promerus LLC, USA). PCT Int. Appl. WO 2004074933 A2 20040902, 94 pp. DESIGNATED STATES: W: AE, AE, AG, AL, AL, AM, AM, AT, AT, AU, AZ, AZ, BA, BB, BG, BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR, CR, CU, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EC, EC, EE, EE, EG, ES, ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN, IS, JP, JP, KE, KE, KG, KG, KP, KP, KP, KR, KR, KZ, KZ, LC, LK, LR, LS, LS, LT, LU, LU, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ, NA, NI; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, BF, BJ, CF, CG, CI, CM, GA, ML, MR, NE, SN, TD, TG, TR. (English). CODEN: PIXXD2.

APPLICATION: WO 2004-US5043 20040220. PRIORITY: US 2003-PV448612 20030220; US 2003-PV512126 20031017.

AB The present invention relates to oligomers of polycyclic olefin monomers, and optionally allylic or olefinic monomers, and a method of making such oligomers that includes reacting polycyclic olefin monomers in the presence of a Ni or Pd contg. catalyst, or in the case of allylic monomers in the presence of a free radical initiator. The oligomers can be included in photoresist compns. as dissoln. rate modifiers. The photoresist compns. can further include a polymeric binder resin, a photoacid generator, and solvents.

IT **749897-75-4P 749897-77-6DP**, reaction product with glacial acetic acid and/or chloromethyl methylether or bromo butylacetate **749897-77-6P 749897-78-7DP**, reaction product with Bu carbonate group or Me methylether group **749897-78-7P 749897-80-1DP**, reaction product with glacial acetic acid or/and chloromethyl methylether **749897-80-1P 749897-81-2P**

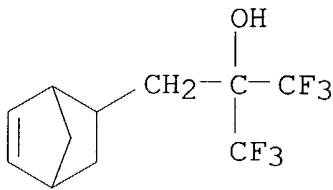
(oligomeric; dissoln. rate modifiers for photoresist compns.)

RN 749897-75-4 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with ethene (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O



CM 2

CRN 74-85-1  
CMF C2 H4

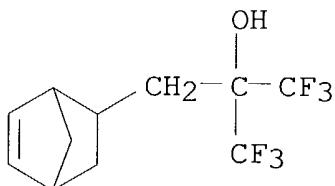
H<sub>2</sub>C=CH<sub>2</sub>

RN 749897-77-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and ethene (9CI) (CA INDEX NAME)

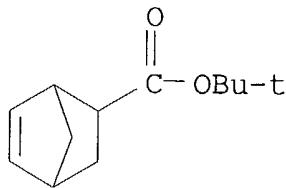
CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O



CM 2

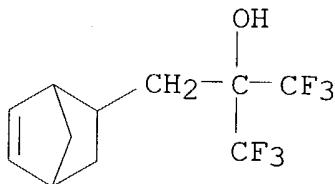
CRN 154970-45-3  
CMF C12 H18 O2



CM 3

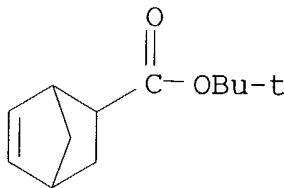
CRN 74-85-1  
CMF C2 H4H<sub>2</sub>C=CH<sub>2</sub>RN 749897-77-6 HCA  
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester,  
polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-  
5-ene-2-ethanol and ethene (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 2

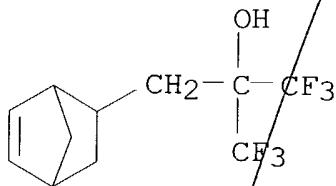
CRN 154970-45-3  
CMF C12 H18 O2



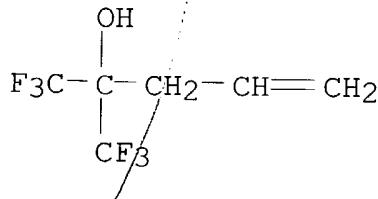
CM 3

CRN 74-85-1  
CMF C2 H4 $\text{H}_2\text{C}=\text{CH}_2$ RN 749897-78-7 HCA  
CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 1,1,1-trifluoro-2-(trifluoromethyl)-4-penten-2-ol (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 2

CRN 646-97-9  
CMF C6 H6 F6 O

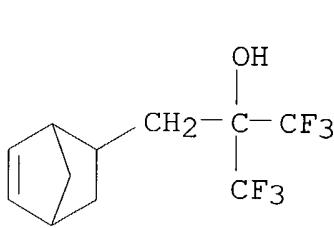
RN 749897-78-7 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 1,1,1-trifluoro-2-(trifluoromethyl)-4-penten-2-ol (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

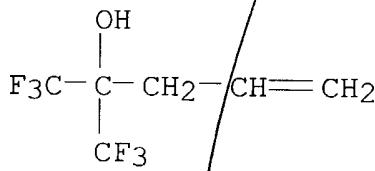
CMF C11 H12 F6 O



CM 2

CRN 646-97-9

CMF C6 H6 F6 O



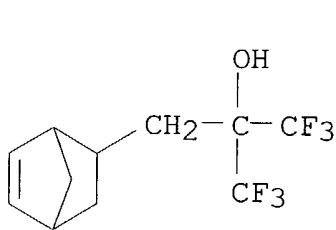
RN 749897-80-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 1,1,1-trifluoro-2-(trifluoromethyl)-4-penten-2-ol (9CI) (CA INDEX NAME)

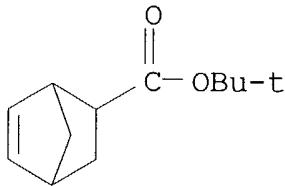
CM 1

CRN 196314-61-1

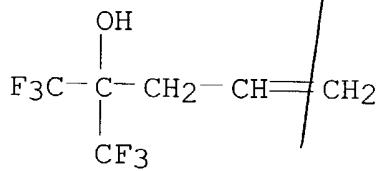
CMF C11 H12 F6 O



CM 2

CRN 154970-45-3  
CMF C12 H18 O2

CM 3

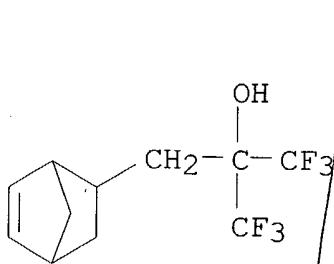
CRN 646-97-9  
CMF C6 H6 F6 O

RN 749897-80-1 HCA

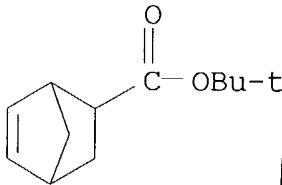
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester,  
polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-  
5-ene-2-ethanol and 1,1,1-trifluoro-2-(trifluoromethyl)-4-penten-2-  
ol (9CI) (CA INDEX NAME)

CM 1

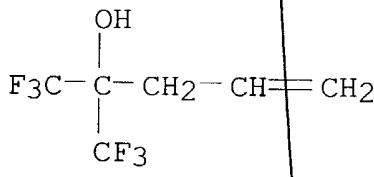
CRN 196314-61-1  
CMF C11 H12 F6 O



CM 2

CRN 154970-45-3  
CMF C12 H18 O2

CM 3

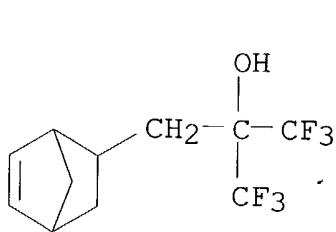
CRN 646-97-9  
CMF C6 H6 F6 O

RN 749897-81-2 HCA

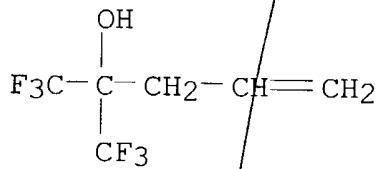
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, polymer with  
.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-  
ethanol and 1,1,1-trifluoro-2-(trifluoromethyl)-4-penten-2-ol (9CI)  
(CA INDEX NAME)

CM 1

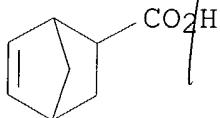
CRN 196314-61-1  
CMF C11 H12 F6 O



CM 2

CRN 646-97-9  
CMF C6 H6 F6 O

CM 3

CRN 120-74-1  
CMF C8 H10 O2

IC ICM G03F

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT Section cross-reference(s): 35, 38

26008-45-7P 478979-97-4P 749897-67-4P 749897-69-6P

**749897-75-4P** 749897-76-5P **749897-77-6P**,reaction product with glacial acetic acid and/or chloromethyl methylether or bromo butylacetate **749897-77-6P****749897-78-7P**, reaction product with Bu carbonate group or Me methylether group **749897-78-7P** **749897-80-1DP**,reaction product with glacial acetic acid or/and chloromethyl methylether **749897-80-1P** **749897-81-2P**749897-82-3DP, epoxides, diols, acetate, **alc.** derivs. or reaction product with chloromethyl Me ether

(oligomeric; dissoln. rate modifiers for photoresist compns.)

L26 ANSWER 5 OF 16 HCA COPYRIGHT 2004 ACS on STN

141:181965 Fluorine-containing compounds as dissolution inhibitors and intermediates for monomers, and their polymers for resists. Narita, Tadashi; Maeda, Kazuhiko (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2004217533 A2 20040805, 22 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2003-4262 20030110.

AB The compds. bear substituents  $OR_1CF_2CH(OR_2)CF_3$  ( $R_1$  = alkyl, alkylene, structure contg. arom. ring and/or alicyclic structure;  $R_1$  may have F, halo, CN, O, N, Si, alc.;  $R_2$  = H, alkyl, arom. group, hydrocarbyl;  $R_2$  may have F, O, N, carbonyl, alc.). Preferably, the monomers are  $CH_2:CR_3CO_2R_1CF_2CH(OR_2)CF_3$  [ $R_1$ ,  $R_2$  = same as above;  $R_3$  = H, F, (fluoro)alkyl, cyano]. The resists show good vacuum-UV transparency, etching resistance, and adhesion to substrates.

IT 357397-07-0P 733049-86-0P 733049-96-2P

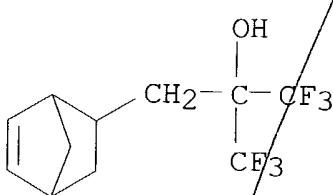
(F-contg. compds. as monomers and dissoln. inhibitors, and polymers for resists showing good vacuum-UV transparency, etching resistance, and adhesion to substrates)

RN 357397-07-0 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O



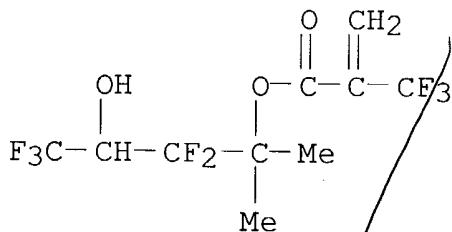
RN 733049-86-0 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,2,4,4,4-pentafluoro-3-hydroxy-1,1-dimethylbutyl 2-(trifluoromethyl)-2-propenoate (9CI) (CA INDEX NAME)

CM 1

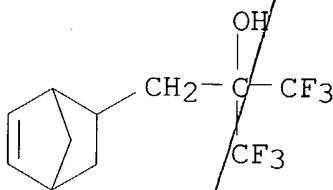
CRN 733049-85-9

CMF C10 H10 F8 O3



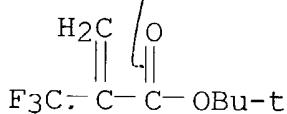
CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O



CM 3

CRN / 105935-24-8  
CME / C8 H11 F3 O2

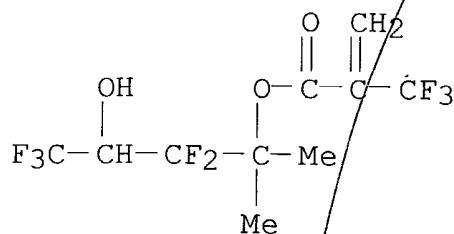


RN 733049-96-2 HCA

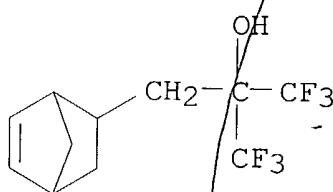
CN 2-Propenoic acid, 2-(trifluoromethyl)-, 2,2,4,4,4-pentafluoro-3-hydroxy-1,1-dimethylbutyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

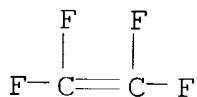
CRN 733049-85-9  
CMF C10 H10 F8 03



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 3

CRN 116-14-3  
CMF C2 F4

IC ICM C07C069-78

ICS C07C031-20; C07C043-23; C07C069-653; C08F014-18; G03F007-004;  
G03F007-038; G03F007-039CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)

Section cross-reference(s): 23, 24, 25, 28, 35, 38

IT 357397-07-0P 733049-86-0P 733049-88-2P

733049-93-9P 733049-95-1P 733049-96-2P 733049-98-4P

733049-99-5P 733050-00-5P

(F-contg. compds. as monomers and dissoln. inhibitors, and  
polymers for resists showing good vacuum-UV transparency, etching  
resistance, and adhesion to substrates)

IT 64-17-5, Ethanol, reactions 67-63-0, Isopropyl alcohol,

reactions 109-92-2, Ethyl vinyl ether 123-91-1; Dioxane, reactions 15232-99-2 53841-60-4 90715-73-4 (F-contg. compds. as monomers and dissoln. inhibitors, and polymers for resists showing good vacuum-UV transparency, etching resistance, and adhesion to substrates)

L26 ANSWER 6 OF 16 HCA COPYRIGHT 2004 ACS on STN

141:61989 Wetting and dissolution studies of fluoropolymers used in 157 nm photolithography applications. Markley, T. J.; Marsella, J. A.; Robertson, E. A., III; Parris, G. E.; Zarkov, Z.; Jakubek, V.; Ober, C. K. (Air Products and Chemicals, Incorporated, Allentown, PA, 18195, USA). Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures--Processing, Measurement, and Phenomena, 22(1), 140-145 (English) 2004. CODEN: JVSTBM. ISSN: 1071-1023. Publisher: American Institute of Physics.

AB Photolithog. using the F2 excimer laser at 157 nm, a technol. to bridge traditional optical lithog. and next generation lithogs., promises to enable ultralarge scale integrated devices with sub-70 nm design rules. Chem. amplified resists based on fluoropolymers have previously been shown to be good candidates for 157 nm microlithog. In our research, hexafluoroisopropyl **alc.**

(HFIPA) groups have been incorporated into polymers to improve the base solv. and to increase the transparency needed for new photoresists at 157 nm. These new polymers have absorbance values at 157 nm ranging from 1.7 to 3.9 .mu.m-1. The introduction of fluorine groups increases their hydrophobicity and makes these polymers more difficult to wet at the surface. We have studied the effect of fluorine content on hydrophobicity of fluorinated polymers by measuring contact angle data over short time intervals. The ability to combine fluoropolymer synthesis with extensive contact angle studies has proven to be valuable in understanding solv. characteristics of these resins. These studies indicate that many of the fluorinated polymers have a very hydrophobic surface.

Lowering contact angles can help to achieve the desired base solv. Wetting studies also indicate that addn. of certain surfactants to 0.26 N aq. tetramethylammonium hydroxide (TMAH) help to reduce the contact angle. In addn. to contact angle studies, we have used a quartz crystal microbalance to det. the dissoln. rate of polymers in an aq. base. Preliminary dissoln. studies indicate a correlation to contact angle findings. Aq. base solns. of 0.26 N TMAH contg. surfactants were found to significantly lower the contact angle of an HFIPA-contg. polymer, and increase the dissoln. rate by an order of magnitude.

IT 357397-07-0P 370102-75-3P

(wetting and dissoln. studies of fluoropolymers used in 157 nm photolithog. applications)

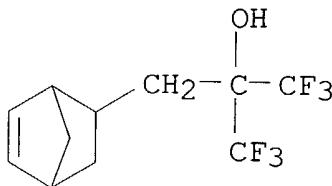
RN 357397-07-0 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-

bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O

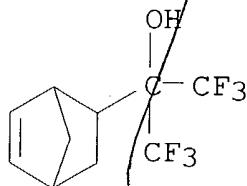


RN 370102-75-3 HCA

CN Bicyclo[2.2.1]hept-2-ene-2-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 369375-16-6  
CMF C10 H10 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 28825-19-6P 181020-29-1P 357397-07-0P 368422-52-0P  
370102-75-3P 479072-82-7P 705290-81-9P 705290-82-0P  
705290-84-2P 705290-86-4P

(wetting and dissoln. studies of fluoropolymers used in 157 nm photolithog. applications)

L26 ANSWER 7 OF 16 HCA COPYRIGHT 2004 ACS on STN

140:365502 Design and study of resist materials for 157-nm lithography. Yamada, Shintaro; Cho, Sungseo; Zampini, Anthony (Shipley Co. LLC, Marlborough, MA, 01752, USA). Proceedings of SPIE-The International Society for Optical Engineering, 5039(Pt. 1, Advances in Resist Technology and Processing XX), 569-579 (English) 2003. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB The authors investigated the structure-property relationships of several polymer platforms contg. hexafluoroisopropanol (HFIP) and tertiary alkyl ester functionalities in order to identify and develop fluorine-contg. polymers suitable for 157 nm lithog. The authors obsd. that the aq. base solv. of homopolymers contg. HFIP was highly dependent on the monomer structure, no. of HFIP group per monomer unit, substituent on the **alc.** and the polymer architecture. Copolymers of tert-Bu acrylate (TBA), tert-Bu 2-fluoroacrylate (TBFA) and tert-Bu 2-trifluoromethylacrylate (TBTMFA) with styrenehexafluoroisopropanol (STYHFIP) or norbornene hexafluoroisopropanol (NBHFIP) were also investigated to det. the effect of substitution at the acrylate *.alpha.*-position. Under the same ration of STYHFIP, the transparency of the co-polymers improved in the order of CF<sub>3</sub>>F>H while the dry etch stability decreased in the order of CF<sub>3</sub>>F>H. When exposed to 157 nm radiation, photoresists of P(STYHFIP-TBA), P(STYHFIP-TBFA) and P(STYHFIP-TBTMFA) showed an increase in E<sub>0</sub> in the order of H<F<CF<sub>3</sub>, but the difference was marginal. The PEB sensitivity was nearly identical for all three co-polymers suggesting that the nature of the substituent at the *.alpha.*-position of the acrylate monomer did not have a significant impact on the deprotection chem. The photospeed of P(NBHFIP-TBTMFA) was much slower than that of P(STYHFIP-TBTMFA) due to a slower dissoln. rate of NBHFIP than that of STYHFIP and to the influence of the polymer matrix on the deprotection reaction.

IT 634196-80-8 634200-93-4

(comparison of dissoln. rates of polymers contg. hexafluoroisopropanol pendant groups in relation to design of 157-nm lithog. photoresists)

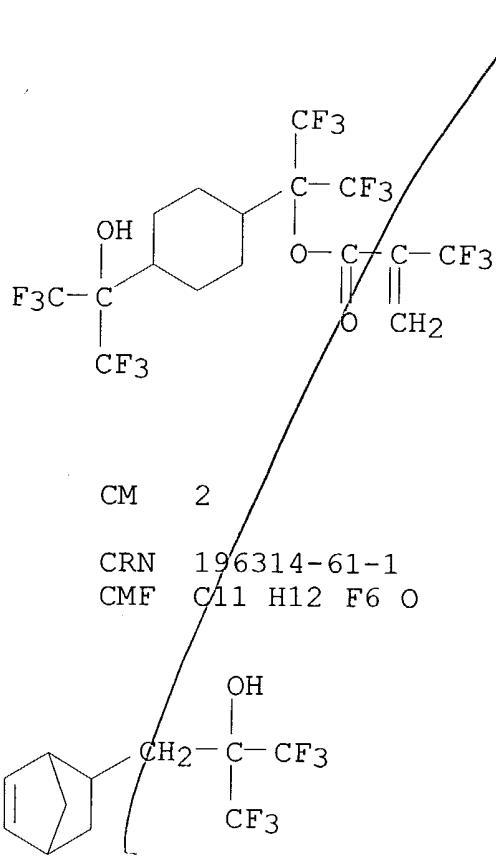
RN 634196-80-8 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 2,2,2-trifluoro-1-[4-[2,2,2-trifluoro-1-hydroxy-1-(trifluoromethyl)ethyl]cyclohexyl]-1-(trifluoromethyl)ethyl ester, polymer with *.alpha.*,*.alpha.*-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

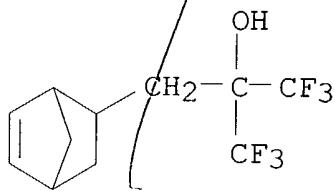
CM 1

CRN 479072-83-8

CMF C16 H13 F15 O3



CM 2  
 CRN 196314-61-1  
 CMF C11 H12 F6 O

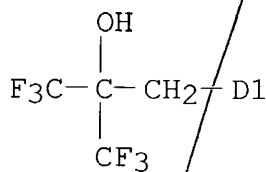
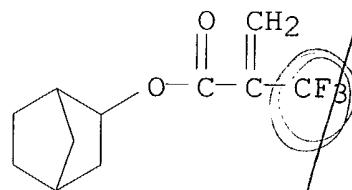


RN 634200-93-4 HCA

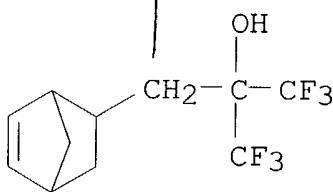
CN 2-Propenoic acid, 2-(trifluoromethyl)-, 5(or 6)-[3,3,3-trifluoro-2-hydroxy-2-(trifluoromethyl)propyl]bicyclo[2.2.1]hept-2-yl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

CM 1

CRN 585571-44-4  
 CMF C15 H15 F9 O3  
 CCI IDS



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

IT 634196-79-5

(lithog. evaluation of photoresists for 157-nm lithog. based on terpolymers contg. hexafluoroisopropanol- and tertiary alkyl ester groups)

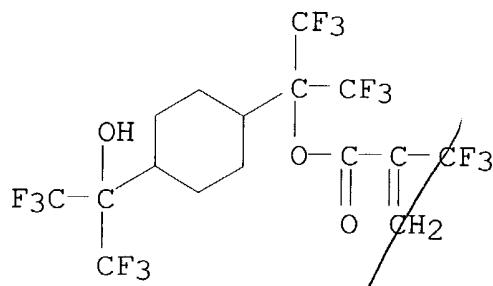
RN 634196-79-5 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 2,2,2-trifluoro-1-[4-[2,2,2-trifluoro-1-hydroxy-1-(trifluoromethyl)ethyl]cyclohexyl]-1-(trifluoromethyl)ethyl 2-(trifluoromethyl)-2-propenoate (9CI) (CA INDEX NAME)

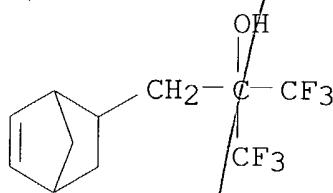
CM 1

CRN 479072-83-8

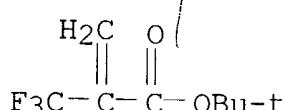
CMF C16 H13 F15 O3



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 3

CRN 105935-24-8  
CMF C8 H11 F3 O2

IT 357397-07-0 370102-75-3

(ref. compd.; comparison of dissoln. rates of polymers contg. hexafluoroisopropanol pendant groups in relation to design of 157-nm lithog. photoresists)

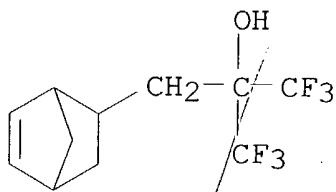
RN 357397-07-0 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



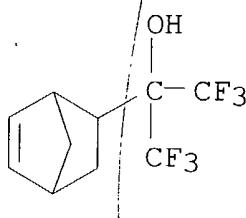
RN 370102-75-3 HCA

CN Bicyclo[2.2.1]hept-2-ene-2-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 369375-16-6

CMF C10 H10 F6 O



IT 370866-39-0

(structure-property relationships of polymers contg.  
hexafluoroisopropanol- and tertiary alkyl ester groups in  
relation to design photoresists for 157-nm lithog.)

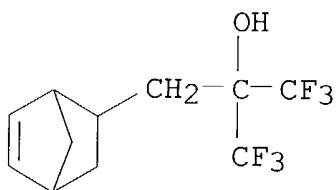
RN 370866-39-0 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester,  
polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-  
5-ene-2-ethanol (9CI) (CA INDEX NAME)

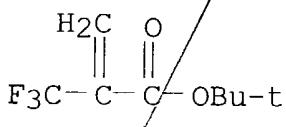
CM 1

CRN 196314-61-1

CMF C11 H12 F6 O



CM 2

CRN 105935-24-8  
CMF C8 H11 F3 O2

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 125431-55-2 368422-52-0 585569-81-9 **634196-80-8**

**634200-93-4**

(comparison of dissoln. rates of polymers contg. hexafluoroisopropanol pendant groups in relation to design of 157-nm lithog. photoresists)

IT **634196-79-5** 681283-51-2

(lithog. evaluation of photoresists for 157-nm lithog. based on terpolymers contg. hexafluoroisopropanol- and tertiary alkyl ester groups)

IT **357397-07-0** **370102-75-3**

(ref. compd.; comparison of dissoln. rates of polymers contg. hexafluoroisopropanol pendant groups in relation to design of 157-nm lithog. photoresists)

IT 370866-13-0 **370866-39-0** 397302-34-0 681283-50-1

(structure-property relationships of polymers contg. hexafluoroisopropanol- and tertiary alkyl ester groups in relation to design photoresists for 157-nm lithog.)

L26 ANSWER 8 OF 16 HCA COPYRIGHT 2004 ACS on STN

140:365498 Novel main-chain-fluorinated polymers for 157-nm photoresists. Toriumi, Minoru; Koh, Meiten; Ishikawa, Takuji; Kodani, T.; Araki, Takayuki; Aoyama, Hirokazu; Yamashita, Tsuneo; Yamazaki, Tamio; Furukawa, Takamitsu; Itani, Toshiro (Daikin Industries Co., Ltd., Osaka, 566-8585, Japan). Proceedings of SPIE-The International Society for Optical Engineering, 5039(Pt. 1, Advances in Resist Technology and Processing XX), 53-60 (English) 2003. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB Main-chain-fluorinated base-resins, including tetrafluoroethylene and norbornene derivs., were synthesized and their fundamental properties, such as transparency at 157 nm and solv. in a std. alk. developer, were characterized. A high transparency, i.e., absorbance of less than 0.5 .mu.m-1, was achieved by optimizing the polymn. conditions with a variety of counter monomers. It was found

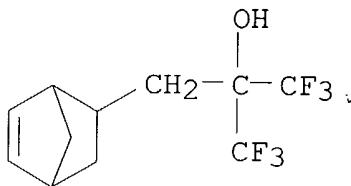
that the polymn. conditions could also control the dissoln. rates of the fluoropolymers and increased the dissoln. rate of unprotected fluoropolymers by about three orders of magnitude, which was sufficient for the alk. developability. Pos.-working resists based on fluororesins were developed and showed good transparency of less than 1 .mu.m-1 at 157 nm, and good solv. in a std. alk. soln. of 0.26-N tetramethylammonium (without any swelling behavior). And an acceptable etching rate as resistant as ArF resists was obtained and 65-nm dense lines could be delineated by the exposure at 157-nm wavelength.

IT 196314-61-1 369375-16-6 484649-17-4

(monomer; polymers based on tetrafluoroethylene and norbornene derivs. and their properties and lithog. performance in chem. amplified photoresist formulations for 157-nm exposures)

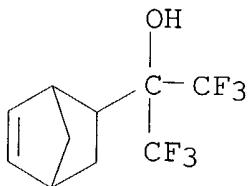
RN 196314-61-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



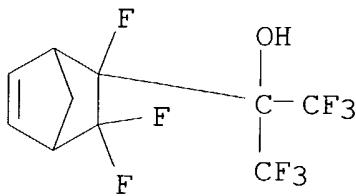
RN 369375-16-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 484649-17-4 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



IT 484649-09-4

(polymers based on fluoroolefins and norbornene derivs. and their properties and lithog. performance in chem. amplified photoresist formulations for 157-nm exposures)

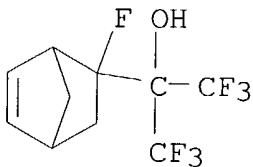
RN 484649-09-4 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethylene (9CI) (CA INDEX NAME)

CM 1

CRN 474516-20-6

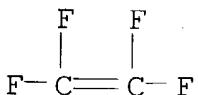
CMF C10 H9 F7 O



CM 2

CRN 116-14-3

CMF C2 F4



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT **Alcohols**, uses

(fluoro; polymers based on fluoroolefins and norbornene derivs. and their properties and lithog. performance in chem. amplified photoresist formulations for 157-nm exposures)

IT 116-14-3, Tetrafluoroethylene, uses 196314-61-1

196314-63-3 365568-55-4 **369375-16-6** 370102-71-9  
 484649-08-3 **484649-17-4**

(monomer; polymers based on tetrafluoroethylene and norbornene derivs. and their properties and lithog. performance in chem. amplified photoresist formulations for 157-nm exposures)

IT 365568-44-1 **484649-09-4** 501097-70-7 681286-83-9  
 (polymers based on fluoroolefins and norbornene derivs. and their properties and lithog. performance in chem. amplified photoresist formulations for 157-nm exposures)

L26 ANSWER 9 OF 16 HCA COPYRIGHT 2004 ACS on STN

140:21270 Photoresist composition containing acrylic polymers. Allen, Robert David; Breyta, Gregory; Brock, Phillip; DiPietro, Richard A.; Fenzel-Alexander, Debra; Larson, Carl; Medeiros, David R.; Pfeiffer, Dirk; Sooriyakumaran, Ratnam; Truong, Hoa D.; Wallraff, Gregory M. (International Business Machines Corporation, USA). U.S. Pat. Appl. Publ. US 2003224283 A1 20031204, 15 pp. (English). CODEN: USXXCO.

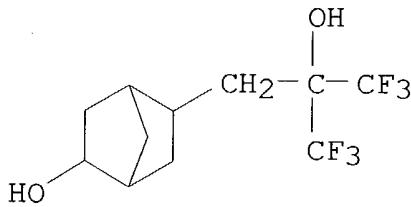
APPLICATION: US 2002-159635 20020531.

AB A photoresist compn. is provided that includes a polymer having at least one acrylate or methacrylate monomer that includes at least one fluoro alc. group. A method of patterning a substrate using the photoresist compn. is also provided herein.

IT **630414-93-6P**  
 (prepn. of acrylic polymer for photoresist)

RN 630414-93-6 HCA

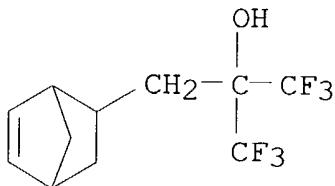
CN Bicyclo[2.2.1]heptane-2-ethanol, 5-hydroxy-.alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



IT **196314-61-1**  
 (prepn. of acrylic polymer for photoresist)

RN 196314-61-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



IC ICM G03F007-004  
 NCL 430270100; 430910000; 430281100; 430907000; 430325000; 430323000;  
 430927000  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 ST photoresist fluoro **alc** modified acrylic polymer  
 IT 17295-11-3P 34844-48-9P 52468-67-4P 309752-65-6P  
 630414-83-4P 630414-85-6P 630414-87-8P 630414-91-4P  
**630414-93-6P** 630414-95-8P 630414-98-1P  
 (prepn. of acrylic polymer for photoresist)  
 IT 79-41-4, Methacrylic acid, reactions 646-97-9 920-46-7,  
 Methacryloyl chloride 5380-87-0 16712-64-4 **196314-61-1**  
 (prepn. of acrylic polymer for photoresist)

L26 ANSWER 10 OF 16 HCA COPYRIGHT 2004 ACS on STN

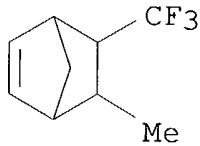
139:237695 Fluorinated molecules for preparing polymer in photoresist  
 composition and methods of making and using same. Poss, Andrew;  
 Nalewajek, David; Demmin, Timothy R.; Nair, Haridasan K. (Honeywell  
 International Inc., USA). PCT Int. Appl. WO 2003073169 A2 20030904,  
 34 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB,  
 BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,  
 ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
 NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN,  
 TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ,  
 MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK,  
 ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN,  
 TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2003-US5142  
 20030221. PRIORITY: US 2002-PV358592 20020221.

AB Provided are polymers derived from fluoroalkyl norbornenes,  
 fluorinated crotonates, fluorinated allyl **alcs.**, and  
 combinations of two or more thereof for use in a wide variety of  
 applications, including photoresist compns. Also provided are  
 methods for producing the fluoroalkyl norbornenes, fluorinated  
 crotonates, and fluorinated allyl **alcs.** for use in the  
 present polymers. Fluorinate mol. provides polymer showing  
 transparency at 157 nm.

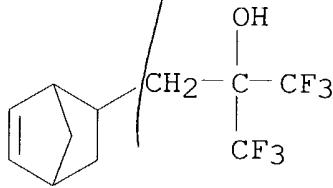
IT **591733-51-6P**  
 (fluorinated mols. for photoresist and methods of making and

using same)  
 RN 591733-51-6 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 5-methyl-6-(trifluoromethyl)bicyclo[2.2.1]hept-2-ene (9CI) (CA INDEX NAME)

CM 1

CRN 591733-50-5  
CMF C9 H11 F8

CM 2

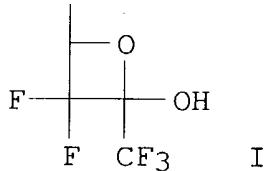
CRN 196314-61-1  
CMF C11 H12 F6 O

IC ICM G03F007-039  
 ICS C08F014-18; C08F032-08  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 35, 76  
 IT 591733-24-3P 591733-27-6P 591733-33-4P 591733-34-5P  
 591733-35-6P 591733-36-7P 591733-37-8P 591733-38-9P  
 591733-39-0P 591733-40-3P 591733-41-4P 591733-42-5P  
 591733-45-8P 591733-46-9P 591733-47-0P 591733-49-2P  
**591733-51-6P**  
 (fluorinated mols. for photoresist and methods of making and using same)

L26 ANSWER 11 OF 16 HCA COPYRIGHT 2004 ACS on STN  
 139:86105 Photosensitive fluoropolymer having hydrate structure and resist composition thereof. Yoon, Kwang Sup; Woo, Sang Kyun; Song,

Ki Yong; Choi, Sang Joon (Samsung Electronics Co., Ltd., S. Korea).  
 Jpn. Kokai Tokkyo Koho JP 2003192729 A2 20030709, 16 pp.  
 (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-368107 20021219.  
 PRIORITY: KR 2001-81252 20011219.

GI



AB Title photosensitive fluoropolymer with wt.-av. mol. wt. 3,000-100,000 contg. a pendant group -[CH(OH)CF<sub>2</sub>C(OH)<sub>2</sub>(CF<sub>3</sub>)]<sub>n</sub>, and formula I. Thus, 1-bicyclo[2.2.1]hept-5-ene-2-yl-2,2,4,4,4-pentafluorobutane-1,3,3-triol was synthesized by reacting hexafluoroisopropyl **alc.** with 5-norbornene-2-carboxaldehyde in the presence of Bu lithium. Then, the obtained monomer was copolymerd. with 1-bicyclo[2.2.1]hept-5-ene-2-yl-1,1,1,3,3-hexafluoropropane-2-ol and tert-Bu 2-trifluoromethacrylate using AIBN as a polymn. catalysts to give a photosensitive fluoropolymer for prep. a photoresist.

IT **556053-12-4P**, 1-Bicyclo[2.2.1]hept-5-ene-2-yl-2,2,4,4,4-pentafluorobutane-1,3,3-triol-1-Bicyclo[2.2.1]hept-5-ene-2-yl-1,1,1,3,3-hexafluoropropane-2-ol-tert-Butyl 2-trifluoromethacrylate copolymer **556053-22-6P**, 1-Bicyclo[2.2.1]hept-5-ene-2-yl-1,1,1,3,3-hexafluoropropane-2-ol-tert-Butyl 2-trifluoromethacrylate-2-trifluoromethyl-2-hydroxy-3,3-difluoro-4-phenyloxyethane copolymer  
 (photosensitive fluoropolymers; prep. of photosensitive fluoropolymer for photoresists)

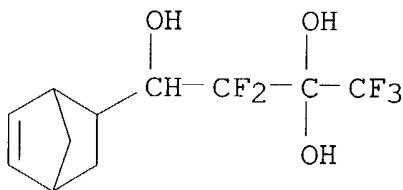
RN 556053-12-4 HCA

CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with 1-bicyclo[2.2.1]hept-5-en-2-yl-2,2,4,4,4-pentafluoro-1,3,3-butanetriol and .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol (9CI) (CA INDEX NAME)

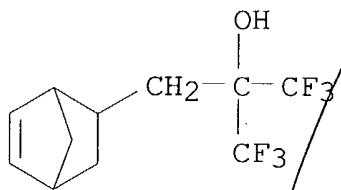
CM 1

CRN 556053-07-7

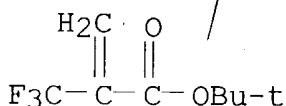
CMF C11 H13 F5 O3



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 3

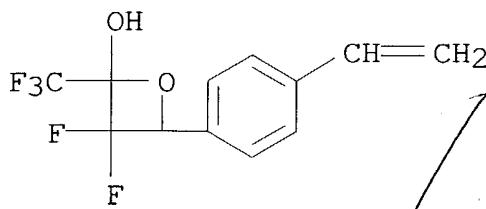
CRN 105935-24-8  
CMF C8 H11 F3 O2

RN 556053-22-6 HCA

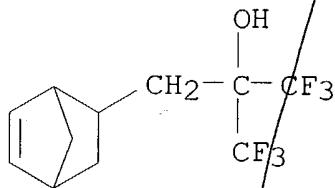
CN 2-Propenoic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and 4-(4-ethenylphenyl)-3,3-difluoro-2-(trifluoromethyl)-2-oxetanol (9CI) (CA INDEX NAME)

CM 1

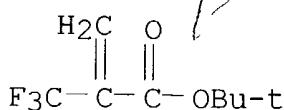
CRN 556053-11-3  
CMF C12 H9 F5 O2



CM 2

CRN 196314-61-1  
CMF C11 H12 F6 O

CM 3

CRN 105935-24-8  
CMF C8 H11 F3 O2

IC ICM C08F032-04

ICS C08F012-14; C08F032-08; C08F212-06; C08F220-10; G03F007-039;  
H01L021-027CC 37-3 (Plastics Manufacture and Processing)  
Section cross-reference(s): 74, 76IT **556053-12-4P**, 1-Bicyclo[2.2.1]hept-5-ene-2-yl-2,2,4,4,4-pentafluorobutane-1,3,3-triol-1-Bicyclo[2.2.1]hept-5-ene-2-yl-1,1,1,3,3-hexafluoropropane-2-ol-tert-Butyl 2-trifluoromethacrylate copolymer **556053-13-5P**, 1-Bicyclo[2.2.1]hept-5-ene-2-yl-2,2,4,4,4-pentafluorobutane-1,3,3-triol-tert-Butyl 2-trifluoromethacrylate-1,1,1-Trifluoro-2-(4-vinylphenyl)propane-2-ol copolymer **556053-14-6P**, 1-Bicyclo[2.2.1]hept-5-ene-2-yl-2,2,4,4,4-pentafluorobutane-1,3,3-triol-tert-Butyl 2-trifluoromethacrylate-1,1,1,3,3-Hexanfluoro-2-(4-

vinylphenyl)propane-2-ol copolymer 556053-15-7P,  
 1-Bicyclo[2.2.1]hept-5-ene-2-yl-2,2,4,4,4-pentafluorobutane-1,3,3-  
 triol-tert-Butyl 2-trifluoro-1-trifluoromethyl-1-(4-  
 vinylphenyl)ethyl carbonate-tert-Butyl 2-trifluoromethacrylate  
 copolymer 556053-16-8P, 1-Bicyclo[2.2.1]hept-5-ene-2-yl-2,2,4,4,4-  
 pentafluorobutane-1,3,3-triol-tert-Butyl 2-trifluoromethacrylate-  
 1,1,1,3,3,3-Hexanfluoro-2-(4-vinylphenyl)propane-2-ol-  
 Trifluoromethacrylate copolymer 556053-17-9P, tert-Butyl  
 2-trifluoromethacrylate-1,1,1,3,3,3-Hexanfluoro-2-(4-  
 vinylphenyl)propane-2-ol-Tetracyclo[4.4.0.12,5.17,10]doceca-5-eneyl-  
 2,2,4,4,4-pentafluorobutane-1,3,3-triol copolymer 556053-18-0P,  
 tert-Butyl 2-trifluoro-1-trifluoromethyl-1-(4-vinylphenyl)ethyl  
 carbonate-tert-Butyl 2-trifluoromethacrylate-  
 Tetracyclo[4.4.0.12,5.17,10]doceca-5-eneyl-2,2,4,4,4-  
 pentafluorobutane-1,3,3-triol copolymer 556053-19-1P, tert-Butyl  
 2-trifluoromethacrylate-1,1,1,3,3,3-Hexanfluoro-2-(4-  
 vinylphenyl)propane-2-ol-1,1,1,3,3-Pentafluoronon-8-ene-2,2,4-triol  
 copolymer 556053-20-4P, tert-Butyl 2-trifluoromethacrylate-2-  
 Trifluoromethyl-2-hydroxy-3,3-difluoro-4-phenyloxyethane copolymer  
 556053-21-5P, tert-Butyl 2-trifluoromethacrylate-1,1,1,3,3-  
 Pentafluoro-5-(4-vinylphenyl)pentane-2,2,4-triol copolymer  
**556053-22-6P**, 1-Bicyclo[2.2.1]hept-5-ene-2-yl-1,1,1,3,3,3-  
 hexafluoropropane-2-ol-tert-Butyl 2-trifluoromethacrylate-2-  
 trifluoromethyl-2-hydroxy-3,3-difluoro-4-phenyloxyethane copolymer  
 (photosensitive fluoropolymers; prepn. of photosensitive  
 fluoropolymer for photoresists)

IT 920-66-1, Hexafluoroisopropyl **alcohol** 1791-26-0,  
 4-Vinylbenzaldehyde 2100-17-6, Pent-4-enal 5453-80-5,  
 5-Norbornene-2-carboxaldehyde 57964-57-5, 8-  
 Aldehydetetracyclo[4.4.0.1]doceca-5-ene 109330-03-2,  
 (4-Vinylphenyl)acetaldehyde  
 (starting materials; prepn. of photosensitive fluoropolymer for  
 photoresists)

L26 ANSWER 12 OF 16 HCA COPYRIGHT 2004 ACS on STN  
 138:392956 Highly transparent resist platforms for 157-nm  
 microlithography: an update. Vohra, Vaishali Raghu; Douki, Katsuji;  
 Kwark, Young-Je; Liu, Xiang-Qian; Ober, Christopher Kemper; Bae,  
 Young C.; Conley, Will; Miller, Daniel; Zimmerman, Paul (Dep. Mater.  
 Sci. Eng., Cornell Univ., Ithaca, NY, 14853, USA). Proceedings of  
 SPIE-The International Society for Optical Engineering, 4690(Pt. 1,  
 Advances in Resist Technology and Processing XIX), 84-93 (English)  
 2002. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The  
 International Society for Optical Engineering.

AB Hexafluoroisopropyl **alc.**-functionalized acrylate monomers  
 and their (co)polymers were prepd. as photoresist platforms for 157  
 nm imaging. In order to balance transparency with other desirable  
 traits such as etch resistance, the authors developed several

copolymer systems. One is using 2-Me adamantyl methacrylate as a comonomer, and the copolymer system showed better dissoln. contrast compared to the copolymer with tetrahydropyranyl methacrylate without sacrificing transparency. To further improve the absorption properties at 157 nm, monomers having  $\alpha$ -trifluoromethyl group were prep'd. and polym'd. in anionic mechanism. The product polymer was unexpectedly transparent at 157 nm ( $A = 1.6 \text{ } \mu\text{m}^{-1}$ ) in spite that all the monomers contain carbonyl group. The second system is the copolymer with p-tert-butoxytetrafluorostyrene.

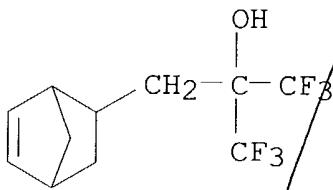
P-Hydroxy-tetrafluorostyrene and p-tert-butoxy-tetrafluorostyrene were polym'd. radically using AIBN in good yield, and the two resulting polymers showed distinctive solv. differences in aq. base soln. Finally, this paper describes the synthesis of new monomers having fluorine (e.g.  $\text{CF}_3$ - group) in the vicinity of the double bond to improve transparency at 157 nm. Due to the lower electron d. of the double bond, these monomers can be polym'd. with electron-rich vinyl monomers using radical initiators.

IT 196314-61-1 369375-16-6

(monomer; design and evaluation of monomers for highly transparent resist platforms for 157-nm microlithog.)

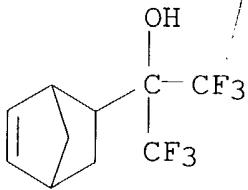
RN 196314-61-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol,  $\alpha,\alpha$ -bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 369375-16-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol,  $\alpha,\alpha$ -bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 479072-79-2P 479072-82-7P 479072-84-9P

(lithog. evaluation of hexafluoroisopropyl alc

.-functionalized acrylate monomers and their polymers as chem. amplified photoresist for 157 nm exposures)

IT 646-97-9 695-12-5 19701-19-0 **196314-61-1** 242812-08-4  
**369375-16-6** 479072-81-6 479072-89-4

(monomer; design and evaluation of monomers for highly transparent resist platforms for 157-nm microlithog.)

IT 188739-86-8P  
 (monomer; polymn. with hexafluoroisopropyl **alc**  
 .-functionalized acrylate monomer)

L26 ANSWER 13 OF 16 HCA COPYRIGHT 2004 ACS on STN

138:90264 Process for production of fluorine-containing norbornene derivatives and their polymers useful for photoresists. Araki, Takayuki; Ishikawa, Takuji; Kume, Takuji; Yamamoto, Akinori (Daikin Industries, Ltd., Japan). PCT Int. Appl. WO 2003006413 A1 20030123, 193 pp. DESIGNATED STATES: W: CN, JP, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2002-JP7112 20020712. PRIORITY: JP 2001-212689 20010712; JP 2001-280548 20010914; JP 2002-43920 20020220.

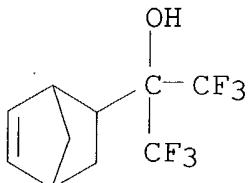
AB The present invention relates to novel norbornene derivs. bearing fluorinated ketone or fluorinated **alc**. moieties attached directly to norbornene skeleton, which are useful as material of chem. amplified photoresists for F2 laser lithog. having excellent transparency and improved dry etching resistance; fluorine-contg. polymers produced by using the derivs. as comonomer; and chem. amplified photoresist compns. each comprising a fluorine-contg. polymer described above, a photoacid generator, and a solvent. Thus, 17 g 5-norbornene-2-carboxylic acid Me ester and 22 g CF<sub>3</sub>SiMe<sub>3</sub> were reacted to give 12 g 5-norbornene-2-yl trifluoromethyl ketone, 12 g of which was reacted with 12 g CF<sub>3</sub>SiMe<sub>3</sub> to give 11 g 5-norbornene-2-yl-hexafluoro-2-propanol, 19.3 g of which was polymd. with 30.0 g TFE to give 3.7 g polymer.

IT **369375-16-6P 457060-24-1P 474516-20-6P**  
**484649-17-4P**

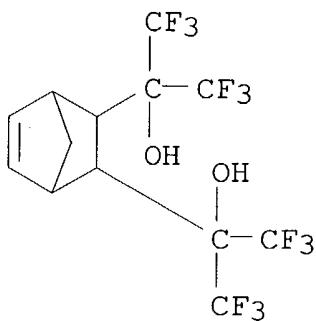
(monomer; prepns. of F-contg. norbornene-type monomers and their polymers useful for photoresists)

RN 369375-16-6 HCA

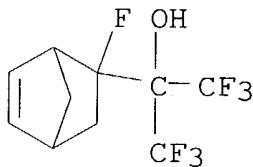
CN Bicyclo[2.2.1]hept-5-ene-2-methanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



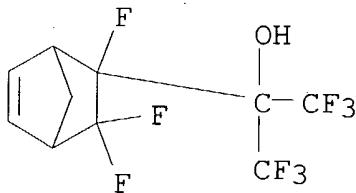
RN 457060-24-1 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2,3-dimethanol,  
 .alpha.,.alpha.,.alpha.',.alpha.'-tetrakis(trifluoromethyl)- (9CI)  
 (CA INDEX NAME)



RN 474516-20-6 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2-fluoro-.alpha.,.alpha.-  
 bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 484649-17-4 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2,3,3-trifluoro-.alpha.,.alpha.-  
 bis(trifluoromethyl)- (9CI) (CA INDEX NAME)

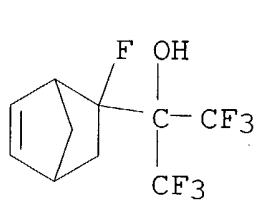


IT 484649-09-4P 484649-10-7P 484649-13-0P  
 484649-14-1P 484649-19-6P 484649-20-9P  
 484649-21-0P 484649-22-1P 484649-23-2P  
 484649-26-5P 484649-27-6P  
 (prepn. of F-contg. norbornene-type monomers and their polymers  
 useful for photoresists)  
 RN 484649-09-4 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

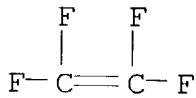
CM 1

CRN 474516-20-6  
CMF C10 H9 F7 O



CM 2

CRN 116-14-3  
CMF C2 F4

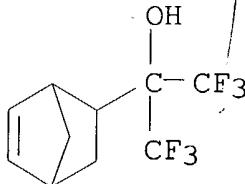


RN 484649-10-7 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

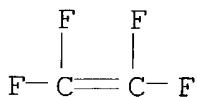
CM 1

CRN 369375-16-6  
CMF C10 H10 F6 O



CM 2

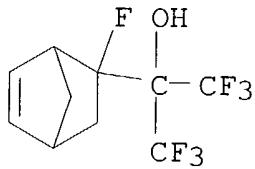
CRN 116-14-3  
 CMF C2 F4



RN 484649-13-0 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-fluoro-,  
 1,1-dimethylethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-  
 bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and  
 tetrafluoroethylene (9CI) (CA INDEX NAME)

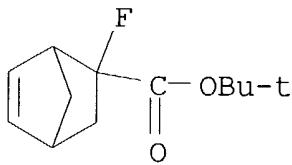
CM 1

CRN 474516-20-6  
 CMF C10 H9 F7 O



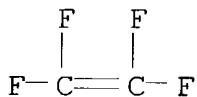
CM 2

CRN 365568-39-4  
 CMF C12 H17 F O2



CM 3

CRN 116-14-3  
 CMF C2 F4



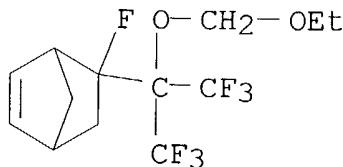
RN 484649-14-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 5-[1-(ethoxymethoxy)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl]-5-fluorobicyclo[2.2.1]hept-2-ene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 484649-08-3

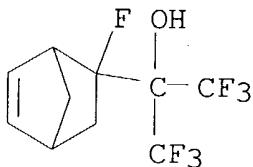
CMF C13 H15 F7 O2



CM 2

CRN 474516-20-6

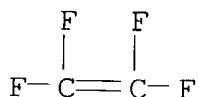
CMF C10 H9 F7 O



CM 3

CRN 116-14-3

CMF C2 F4



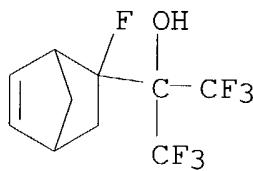
RN 484649-19-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 474516-20-6

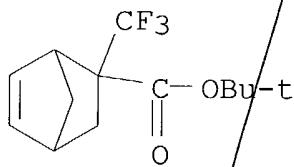
CMF C10 H9 F7 O



CM 2

CRN 365568-55-4

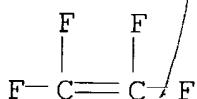
CMF C13 H17 F3 O2



CM 3

CRN 116-14-3

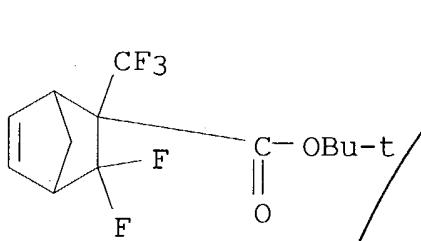
CMF C2 F4



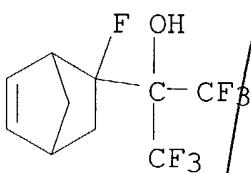
RN 484649-20-9 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 3,3-difluoro-2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and tetrafluoroethene (9CI) (CA INDEX NAME)

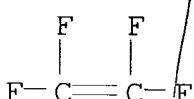
CM 1

CRN 484649-15-2  
CMF C13 H15 F5 O2

CM 2

CRN 474516-20-6  
CMF C10 H9 F7 O

CM 3

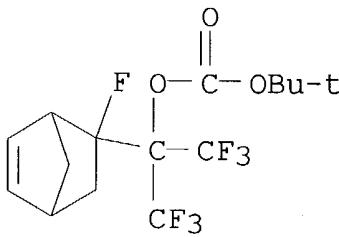
CRN 116-14-3  
CMF C2 F4

RN 484649-21-0 HCA

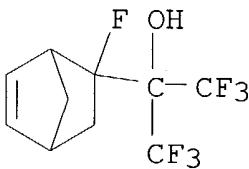
CN Carbonic acid, 1,1-dimethylethyl 2,2,2-trifluoro-1-(2-fluorobicyclo[2.2.1]hept-5-en-2-yl)-1-(trifluoromethyl)ethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

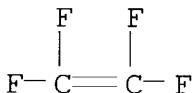
CRN 484649-16-3  
CMF C15 H17 F7 O3



CM 2

CRN 474516-20-6  
CMF C10 H9 F7 O

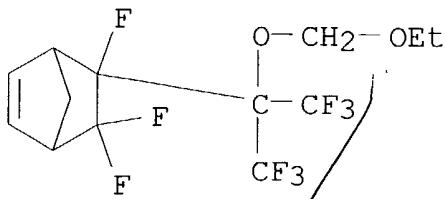
CM 3

CRN 116-14-3  
CMF C2 F4

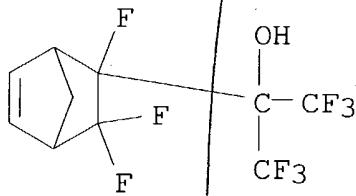
RN 484649-22-1 HCA  
 CN Bicyclo[2.2.1]hept-2-ene-2-methanol, 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 5-[1-(ethoxymethoxy)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl]-5,6,6-trifluorobicyclo[2.2.1]hept-2-ene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

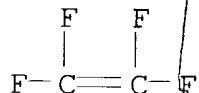
CRN 484649-18-5  
CMF C13 H13 F9 O2



CM 2  
 CRN 484649-17-4  
 CMF C10 H7 F9 O



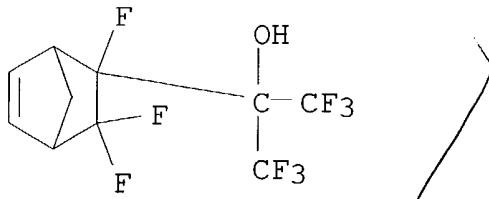
CM 3  
 CRN 116-14-3  
 CMF C2 F4



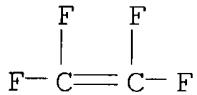
RN 484649-23-2 HCA  
 CN Bicyclo[2.2.1]hept-2-ene-2-methanol, 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethylene (9CI) (CA INDEX NAME)

CM 1

CRN 484649-17-4  
 CMF C10 H7 F9 O



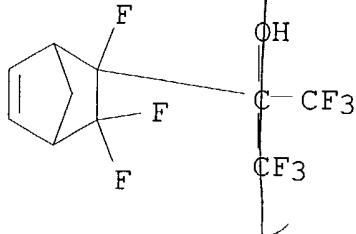
CM 2

CRN 116-14-3  
CMF C2 F4

RN 484649-26-5 HCA

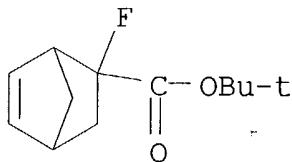
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-fluoro-,  
1,1-dimethylethyl ester, polymer with tetrafluoroethene and  
2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]he-  
pt-2-ene-2-methanol (9CI) (CA INDEX NAME)

CM 1

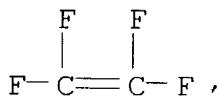
CRN 484649-17-4  
CMF C10 H7 F9 O

CM 2

CRN 365568-39-4  
CMF C12 H17 F O2



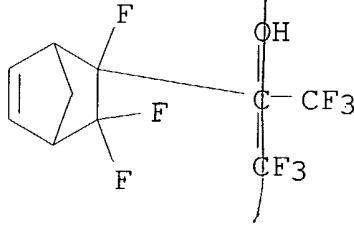
CM 3

CRN 116-14-3  
CMF C2 F4

RN 484649-27-6 HCA

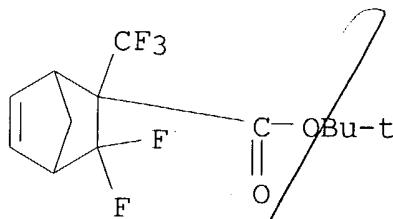
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 3,3-difluoro-2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with tetrafluoroethylene and 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-2-ene-2-methanol (9CI) (CA INDEX NAME)

CM 1

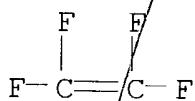
CRN 484649-17-4  
CMF C10 H7 F9 O

CM 2

CRN 484649-15-2  
CMF C13 H15 F5 O2



CM 3  
CRN 116-14-3  
CMF C2 F4



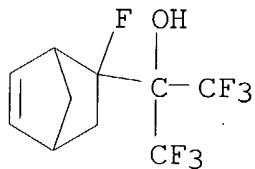
IT 484649-09-4DP, hydrolyzed 484649-10-7DP,  
hydrolyzed 484649-13-0DP, hydrolyzed 484649-14-1DP  
, hydrolyzed 484649-19-6DP, hydrolyzed  
484649-20-9DP, hydrolyzed 484649-21-0DP,  
hydrolyzed 484649-22-1DP, hydrolyzed 484649-23-2DP  
, hydrolyzed 484649-26-5DP, hydrolyzed  
484649-27-6DP, hydrolyzed 484649-29-8P  
(prepn. of F-contg. norbornene-type monomers and their polymers  
useful for photoresists)

RN 484649-09-4 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2-fluoro-.alpha.,.alpha.-  
bis(trifluoromethyl)-, polymer with tetrafluoroethylene (9CI) (CA  
INDEX NAME)

CM 1

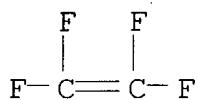
CRN 474516-20-6  
CMF C10 H9 F7 O



CM 2

CRN 116-14-3

CMF C2 F4



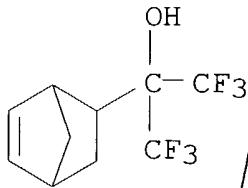
RN 484649-10-7 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-methanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

CRN 369375-16-6

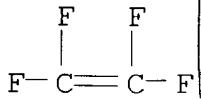
CMF C10 H10 F6 O



CM 2

CRN 116-14-3

CMF C2 F4



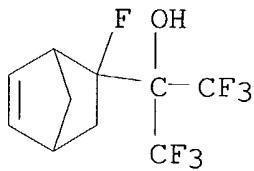
RN 484649-13-0 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-fluoro-, 1,1-dimethylethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and tetrafluoroethene (9CI) (CA INDEX NAME)

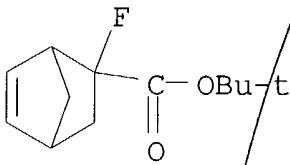
CM 1

CRN 474516-20-6

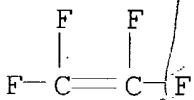
CMF C10 H9 F7 O



CM 2

CRN 365568-39-4  
CMF C12 H17 F O2

CM 3

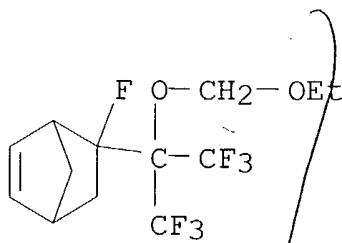
CRN 116-14-3  
CMF C2 F4

RN 484649-14-1 HCA

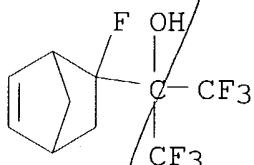
CN Bicyclo[2.2.1]hept-5-ene-2-methanol, 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 5-[1-(ethoxymethoxy)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl]-5-fluorobicyclo[2.2.1]hept-2-ene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

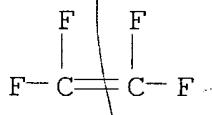
CRN 484649-08-3  
CMF C13 H15 F7 O2



CM 2

CRN 474516-20-6  
CMF C10 H9 F7 O

CM 3

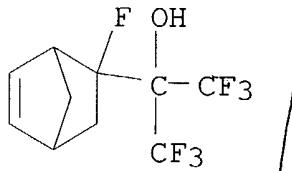
CRN 116-14-3  
CMF C2 F4

RN 484649-19-6 HCA

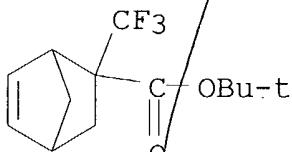
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

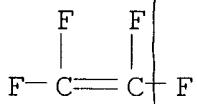
CRN 474516-20-6  
CMF C10 H9 F7 O



CM 2  
 CRN 365568-55-4  
 CMF C13 H17 F3 O2



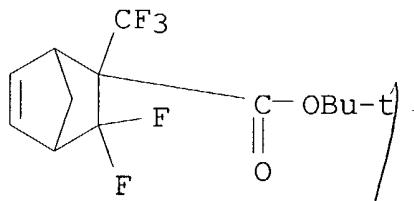
CM 3  
 CRN 116-14-3  
 CMF C2 F4



RN 484649-20-9 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 3,3-difluoro-2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-methanol and tetrafluoroethene (9CI) (CA INDEX NAME)

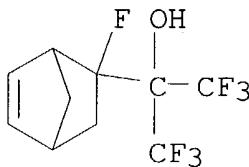
CM 1

CRN 484649-15-2  
 CMF C13 H15 F5 O2



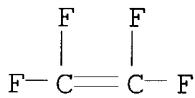
CM 2

CRN 474516-20-6  
CMF C10 H9 F7 O



CM 3

CRN 116-14-3  
CMF C2 F4

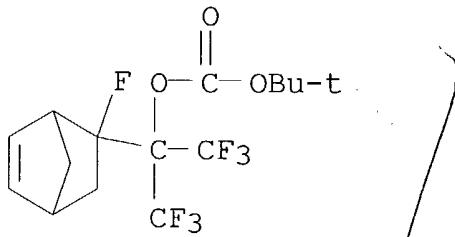


RN 484649-21-0 HCA

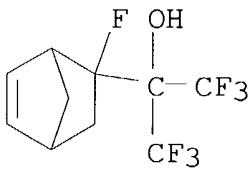
CN Carbonic acid, 1,1-dimethylethyl 2,2,2-trifluoro-1-(2-fluorobicyclo[2.2.1]hept-5-en-2-yl)-1-(trifluoromethyl)ethyl ester, polymer with 2-fluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.1.1]hept-5-ene-2-methanol and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

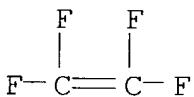
CRN 484649-16-3  
CMF C15 H17 F7 03



CM 2

CRN 474516-20-6  
CMF C10 H9 F7 O

CM 3

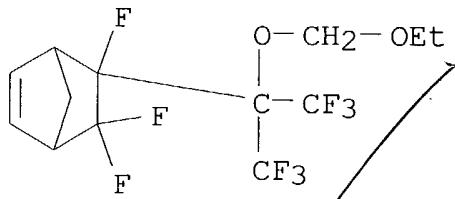
CRN 116-14-3  
CMF C2 F4

RN 484649-22-1 HCA

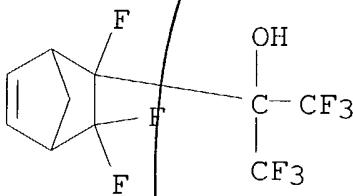
CN Bicyclo[2.2.1]hept-2-ene-2-methanol, 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with 5-[1-(ethoxymethoxy)-2,2,2-trifluoro-1-(trifluoromethyl)ethyl]-5,6,6-trifluorobicyclo[2.2.1]hept-2-ene and tetrafluoroethene (9CI) (CA INDEX NAME)

CM 1

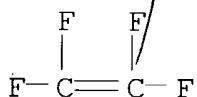
CRN 484649-18-5  
CMF C13 H13 F9 O2



CM 2

CRN 484649-17-4  
CMF C10 H7 F9 O

CM 3

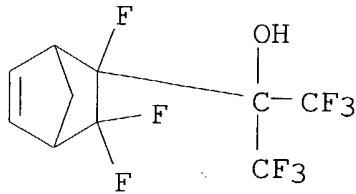
CRN 116-14-3  
CMF C2 F4

RN 484649-23-2 HCA

CN Bicyclo[2.2.1]hept-2-ene-2-methanol, 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)-, polymer with tetrafluoroethylene (9CI) (CA INDEX NAME)

CM 1

CRN 484649-17-4  
CMF C10 H7 F9 O



CM 2

CRN 116-14-3

CMF C2 F4



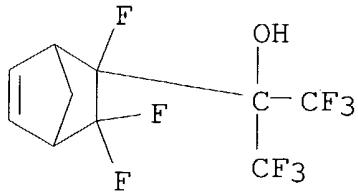
RN 484649-26-5 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 2-fluoro-, 1,1-dimethylethyl ester, polymer with tetrafluoroethene and 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-2-ene-2-methanol (9CI) (CA INDEX NAME)

CM 1

CRN 484649-17-4

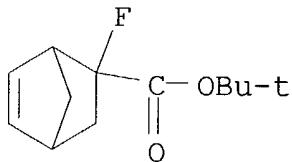
CMF C10 H7 F9 O



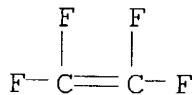
CM 2

CRN 365568-39-4

CMF C12 H17 F O2

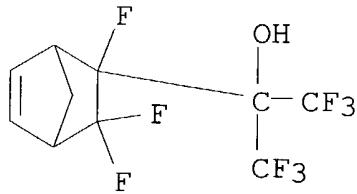


CM 3

CRN 116-14-3  
CMF C2 F4

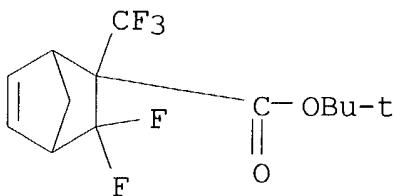
RN 484649-27-6 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 3,3-difluoro-2-(trifluoromethyl)-, 1,1-dimethylethyl ester, polymer with tetrafluoroethene and 2,3,3-trifluoro-.alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-2-ene-2-methanol (9CI) (CA INDEX NAME)

CM 1

CRN 484649-17-4  
CMF C10 H7 F9 O

CM 2

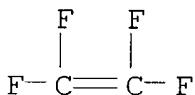
CRN 484649-15-2  
CMF C13 H15 F5 O2



CM 3

CRN 116-14-3

CMF C2 F4



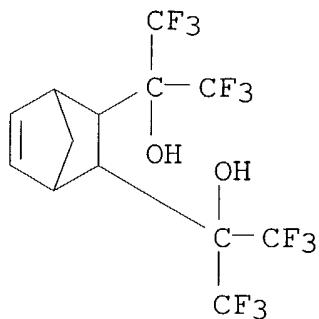
RN 484649-29-8 HCA

CN Bicyclo[2.2.1]hept-5-ene-2,3-dimethanol,  
 $\alpha,\alpha,\alpha,\alpha'$ -tetrakis(trifluoromethyl)-,  
 polymer with tetrafluoroethylene (9CI) (CA INDEX NAME)

CM 1

CRN 457060-24-1

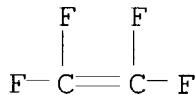
CMF C13 H10 F12 O2



CM 2

CRN 116-14-3

CMF C2 F4



IC ICM C07C045-68  
 ICS C07C049-567; C07C033-44; C07C029-36; C07C043-172; C08F032-00;  
 G03F007-039

CC 35-4 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 74

IT 365568-39-4P **369375-16-6P 457060-24-1P**  
**474516-20-6P** 484649-15-2P 484649-16-3P  
**484649-17-4P** 484649-24-3P  
 (monomer; prepn. of F-contg. norbornene-type monomers and their  
 polymers useful for photoresists)

IT **484649-09-4P 484649-10-7P** 484649-11-8P  
 484649-12-9P **484649-13-0P 484649-14-1P**  
**484649-19-6P 484649-20-9P 484649-21-0P**  
**484649-22-1P 484649-23-2P** 484649-25-4P  
**484649-26-5P 484649-27-6P**  
 (prepn. of F-contg. norbornene-type monomers and their polymers  
 useful for photoresists)

IT **484649-09-4DP**, hydrolyzed **484649-10-7DP**,  
 hydrolyzed 484649-11-8DP, hydrolyzed 484649-12-9DP, hydrolyzed  
**484649-13-0DP**, hydrolyzed **484649-14-1DP**,  
 hydrolyzed **484649-19-6DP**, hydrolyzed **484649-20-9DP**  
 , hydrolyzed **484649-21-0DP**, hydrolyzed  
**484649-22-1DP**, hydrolyzed **484649-23-2DP**,  
 hydrolyzed 484649-25-4DP, hydrolyzed **484649-26-5DP**,  
 hydrolyzed **484649-27-6DP**, hydrolyzed **484649-29-8P**  
 484649-30-1P  
 (prepn. of F-contg. norbornene-type monomers and their polymers  
 useful for photoresists)

L26 ANSWER 14 OF 16 HCA COPYRIGHT 2004 ACS on STN

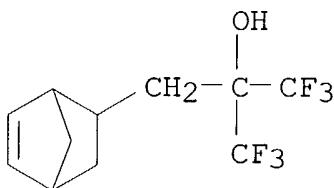
137:317790 Study of PAG size effect on lithographic performance of 157 nm resists. Hanawa, Ryotaro; Hashimoto, Kazuhiko; Uetani, Yasunori (IT-Related Chemicals Research Laboratory, Sumitomo Chemical Co., Ltd., Osaka, 554-8558, Japan). Journal of Photopolymer Science and Technology, 15(4), 619-624 (English) 2002. CODEN: JSTEEW. ISSN: 0914-9244. Publisher: Technical Association of Photopolymers, Japan.

AB Lithog. performances of 157 nm resists based on poly(norbornenehexafluoro *alc.*) partially protected by methoxymethyl were compared using different size of anion of triphenylsulfonium photoacid generator (PAG). Higher resln. and better profile was obsd. for larger anions of TPS PAG. Vacuum-UV discrimination curve measurements by 157 nm open flame exposure, 193

IT nm and 157 nm imaging results were examd.  
 IT 357397-07-0D, partially protected with methoxymethyl groups  
     (lithog. performance of 157 nm resists as function of anion size  
     of triphenylsulfonium photoacid generator)  
 RN 357397-07-0 HCA  
 CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-  
     bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
 CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 IT 107-30-2D, Methoxymethyl chloride, reaction products with  
     poly(norbornenehexafluoro **alc.**) 357397-07-0D,  
     partially protected with methoxymethyl groups  
     (lithog. performance of 157 nm resists as function of anion size  
     of triphenylsulfonium photoacid generator)

L26 ANSWER 15 OF 16 HCA COPYRIGHT 2004 ACS on STN  
 136:110023 Top surface imaging at 157-nm. Jamieson, Andrew Thomas;  
 Somervell, Mark H.; Tran, Hoang Vi; Hung, Raymond Jui-Pu; MacDonald,  
 Scott A.; Willson, C. Grant (Department of Chemical Engineering, The  
 University of Texas at Austin, Austin, TX, 78712, USA). Proceedings  
 of SPIE-The International Society for Optical Engineering, 4345(Pt.  
 1, Advances in Resist Technology and Processing XVIII), 406-416  
 (English) 2001. CODEN: PSISDG. ISSN: 0277-786X. Publisher:  
 SPIE-The International Society for Optical Engineering.  
 AB Top surface imaging (TSI) has had an interesting history. This  
     process showed great promise in the late 1980's and several attempts  
     were made to introduce it to full-scale manufg. Unfortunately,  
     defect d. problems limited the process and it fell from favor. TSI  
     emerged again as an important part of the EUV and 193 nm strategies  
     in the early stages of those programs because it offered a soln. to  
     the high opacity of common resist materials at both wavelengths. A  
     flurry of research in both areas identified the seemingly  
     insurmountable problem of line edge roughness than typical single  
     layer resist systems. This has largely been due to the development

of polymers specifically tailored for this end use. The optimum materials must be moderately transparent and have high TG's in the silylated state. The 157nm program has much in common with the early stages of the 193nm program. The absorbance of even 193nm resist materials at 157nm is far too high to allow their use in single layer applications. The less stringent absorbance of even 193nm resist materials at 157nm is far too high to allow their use in single layer applications. The less stringent absorbance requirements of TSI make it a potentially viable imaging scheme for use at 157nm. Various TSI materials, including the traditional poly(t-BOC- hydroxystyrene), as well as novel aliph. cyclic polymers bearing bis-trifluoromethyl carbinol substituents, were studied for use at 157 nm, and smooth high-resoln. images were generated.

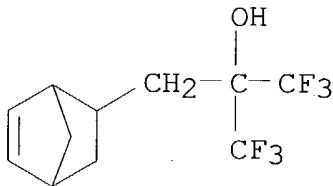
IT 357397-07-0D, reaction products with tert-Bu carbonate  
(top surface imaging at 157-nm)

RN 357397-07-0 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C11 H12 F6 O



CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 76

IT 34619-03-9D, reaction products with poly(tert-butoxycarbonyloxynorbornyl hexafluoro alc.)  
(top surface imaging at 157-nm)

IT 87261-04-9 196314-69-9 357397-07-0D, reaction products with tert-Bu carbonate  
(top surface imaging at 157-nm)

L26 ANSWER 16 OF 16 HCA COPYRIGHT 2004 ACS on STN  
129:276777 Synthesis and evaluation of alicyclic backbone polymers for 193 nm lithography. Ito, Hiroshi; Seehof, Norbert; Sato, Rikiya; Nakayama, Tomonari; Ueda, Mitsuru (IBM Almaden Research Center, San Jose, CA, 95120, USA). ACS Symposium Series, 706(Micro- and Nanopatterning Polymers), 208-223 (English) 1998. CODEN: ACSMC8.

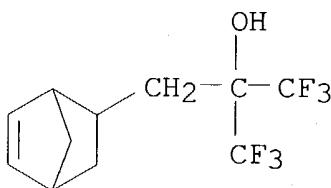
AB ISSN: 0097-6156. Publisher: American Chemical Society.  
 Two approaches, i.e., radical alternating copolymer. of substituted norbornenes with sulfur dioxide and anionic ring-opening polymer. of sultams (cyclic sulfonamides), esp. camphorsultam, were used to prep. new polymers contg. a bicyclic structure in the backbone for use in 193 nm lithog. The second synthetic scheme was supposed to incorporate novel base-sol. sulfonamide functionality in the backbone. In addn. to the sulfonamide, fluoro alc. was selected as another base-sol. functionality, which was incorporated into the norbornene structure, for replacement of carboxylic acid which has been the primary base-solubilizing group employed in 193 nm resists while 248 nm and i-line resists utilize a phenolic functionality for this purpose. Whereas ethane- and propanesultams undergo ring-opening polymer., camphorsultam failed to polymerize. The radical co- and terpolymers. of substituted norbornenes with sulfur dioxide proceeded readily to high conversions in a few hours. The synthesis and preliminary lithog. evaluation of substituted poly(norbornene sulfones) are described.

IT **196314-61-1P**

(monomer; for prepn. of alicyclic backbone polymers for 193 nm lithog.)

RN 196314-61-1 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)

IT **196314-66-6P 214079-68-2P**

(synthesis and evaluation of alicyclic backbone polymers for 193 nm lithog.)

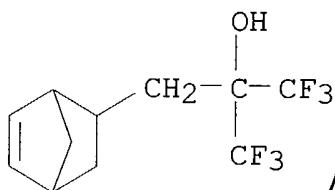
RN 196314-66-6 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with .alpha.,.alpha.-bis(trifluoromethyl)bicyclo[2.2.1]hept-5-ene-2-ethanol and sulfur dioxide (9CI) (CA INDEX NAME)

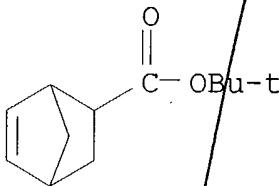
CM 1

CRN 196314-61-1

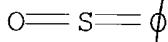
CMF C11 H12 F6 O



CM 2

CRN 154970-45-3  
CMF C<sub>12</sub> H<sub>18</sub> O<sub>2</sub>

CM 3

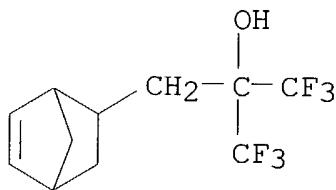
CRN 7446-09-5  
CMF O<sub>2</sub> S

RN 214079-68-2 HCA

CN Bicyclo[2.2.1]hept-5-ene-2-ethanol, .alpha.,.alpha.-bis(trifluoromethyl)-, polymer with sulfur dioxide, alternating  
(9CI) (CA INDEX NAME)

CM 1

CRN 196314-61-1  
CMF C<sub>11</sub> H<sub>12</sub> F<sub>6</sub> O



CM 2

CRN 7446-09-5  
CMF O2 S

O=S=O

CC 37-3 (Plastics Manufacture and Processing)  
Section cross-reference(s): 38, 74IT **196314-61-1P**(monomer; for prepn. of alicyclic backbone polymers for 193 nm  
lithog.)IT **196314-66-6P** 214079-67-1P **214079-68-2P**  
214079-69-3P(synthesis and evaluation of alicyclic backbone polymers for 193  
nm lithog.)